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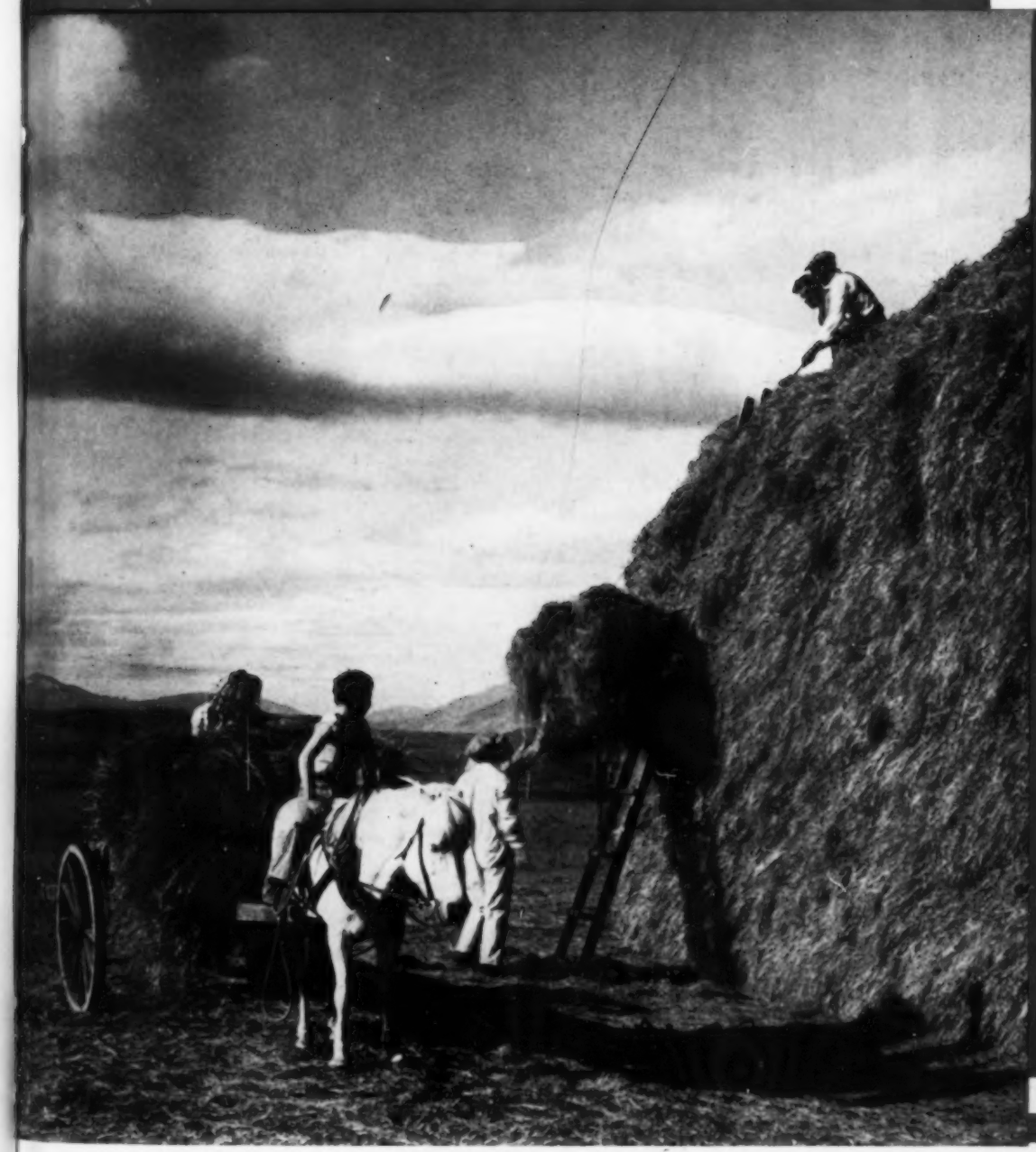

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49 METCALFE STREET OTTAWA, CANADA

CANADIAN GEOGRAPHICAL JOURNAL

Editor - *Gordon M. Dallyn*

49 METCALFE STREET, OTTAWA

This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustrations, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth, and other parts of the world in which Canada has special interest.

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The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1936.

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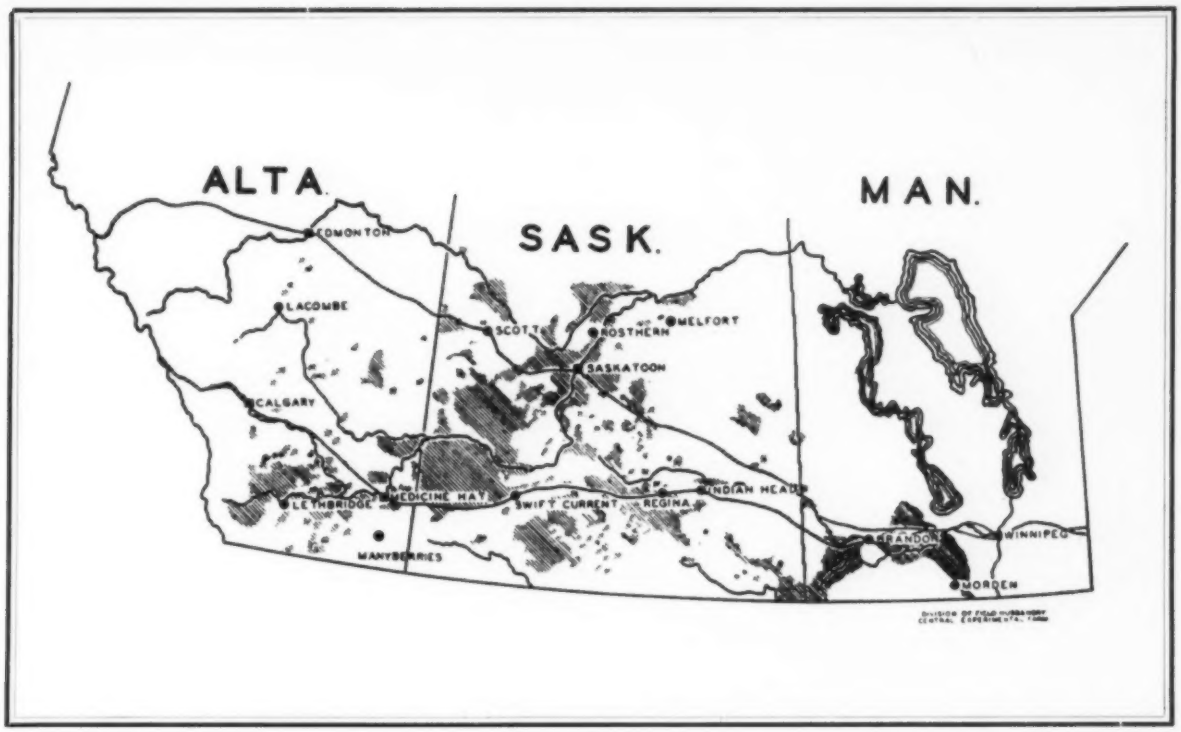
PRAIRIE FARM REHABILITATION

by **E. S. ARCHIBALD**

RECENT conditions of drought and economic depression in the open plains of Western Canada have resulted in an agricultural crisis of unprecedented magnitude. These conditions have not only placed a severe strain on the economy of the Canadian prairies, but have affected adversely the prosperity of the entire Canadian nation. For this reason the Dominion Government, as well as the governments of the three Prairie Provinces, has introduced a number of measures designed for the readjustment and stabilization of prairie agriculture. One such measure, the Prairie Farm Rehbailitation Act, was passed by the Dominion Parliament in 1935 with the object of securing necessary revisions in farm practices and land use policies in the light of advanced knowledge of prairie climatic and soil conditions. The development and progress of the rehabilitation programme inaugurated by this Act is described in this article with special reference to such phases as are conducted by the Experimental Farms Service of the Dominion Department of Agriculture.

Historical Background

The development of agriculture in Western Canada, which has taken place within the past seventy years, has constituted a remarkable experiment in agricultural colonization. When the Dominion of Canada took over the government of the Northwest Territories from the Hudson's Bay Company in 1870, very little was known of probable agricultural conditions on the prairies. Outside of the settlements in Manitoba, which did not completely represent the prairies, there was practically no farming experience for the guidance of future development. As late as 1881 there were only 29,000 acres of cultivated farm land in the Northwest Territories. It was known that the climate was dry, that late spring and early summer frosts might constitute a menace to growing crops, that the potential fertility of most



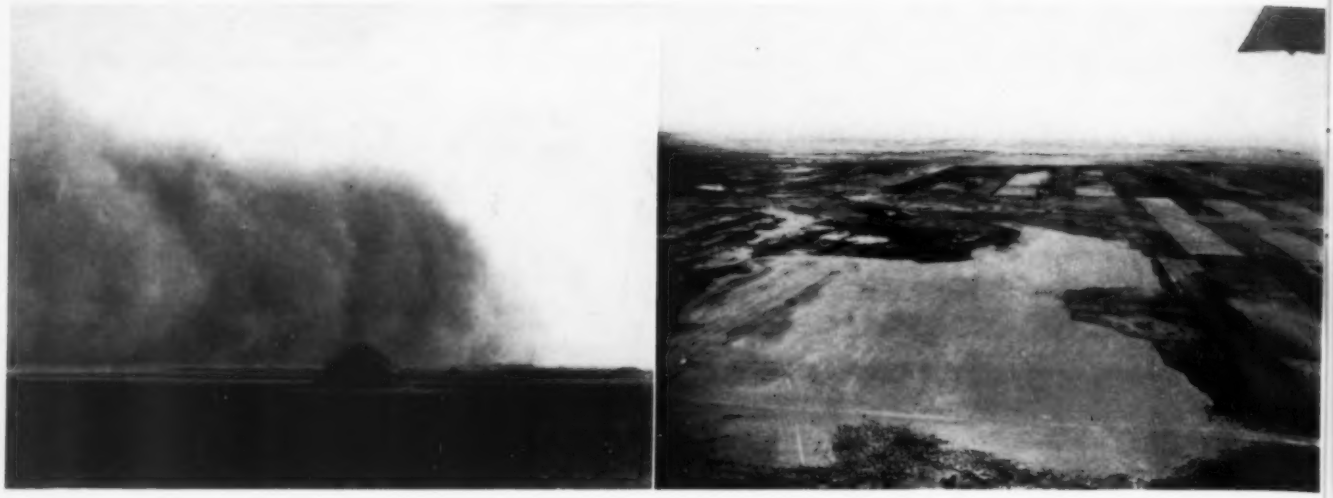
Areas in the Prairie Provinces which have been subject to soil drifting (shown by shading).

of the soil was high, and that there were few obstacles to immediate cultivation. It was not known, however, to what extent precipitation might vary from year to year. Indeed this factor, which has had such a profound influence on the fortunes of prairie agriculture, did not become fully apparent until within the past ten years.

Some idea of the uncertainty which prevailed as to the suitability of the prairies for agricultural settlement may be gained by comparing the conclusions arrived at in early investigations. During the years 1857 to 1860, Captain John Palliser explored the territory between Lake Superior and the Rocky Mountains in the interests of the British Government, with a view to determining the possibilities for agricultural settlement. Palliser came to the conclusion that the south-central portion of this territory was unfit for agriculture by reason of arid climate and infertile soil. This "arid" area, covering roughly 100,000 square miles, constitutes the famous "Palliser triangle" to which further reference will be made. The boundary of this triangle extends roughly from longitude 100° to 104°W, as a base and with the apex at 52° latitude. A broad zone of territory outside the triangle was considered fit for settlement. The same opinion was expressed in 1859 by Professor H. Y. Hind, who explored part of the same area for the Government of Canada. These opinions were based largely on the condition and distribution of native vegetation. Thus, towards the year 1860, the prospects for agricultural settlement in the southern parts of the Prairie Provinces did not appear very hopeful.

Twenty years later, however, a much more optimistic appraisal of the Palliser triangle was made by Professor John Macoun, botanist to the Engineer-in-Chief of the Canadian Pacific Railway. Macoun reduced Palliser's "arid" area to some 20,000 square miles and described the remainder of the triangle as suitable for agriculture.

The somewhat divergent views expressed by Palliser and Hind on the one hand, and by Macoun on the other, may be explained on the basis of cyclic variations in rainfall, the observations of Palliser and Hind being made during a dry cycle of years, and those of Macoun during a wet cycle. The significance of such cyclic variations could not have been apparent, since reliable rainfall records were not kept until about 1885 and after.



Left:—Dust storm on the prairie.
Right:—Aerial photograph of soil drifting area, Cadillac, showing adjacent strip farming control.

The foregoing conditions are illustrative of the paucity of information available for the guidance of government and settlers. Similar initial uncertainties with regard to soil types, suitable crops and cropping practices were also encountered. The evolution of a satisfactory farm economy and farming practices has been the result of a process of trial and error which continued throughout the main period of settlement and is still in progress.

In spite of manifold difficulties, however, the agricultural settlement of the Canadian prairies was rapid and, on the whole, successful. The rapidity of settlement may be illustrated by certain selected statistics. In 1856, when the possibility of prairie settlement was being studied by the British and Canadian Governments, there were only 8,806 acres of improved farm land in the entire territory of the three Prairie Provinces. By 1881 this acreage had increased to 279,000, mostly in Manitoba. Some expansion of settlement accompanied the completion of the first transcontinental railway in 1885, the total area of cultivated land amounting by 1901 to 5,593,000 acres. After 1901 the rate of prairie settlement was phenomenal; the total acreage of improved farm land amounting to 22,970,000 acres by 1911, and to 60,849,957 acres by 1936. There was an increase in population from 12,228 in 1871 to 2,414,891 in 1936.

Thus, within seventy years, the now familiar agricultural economy of the Prairie Provinces, complete with governmental, social and commercial services, has been erected on the former domain of fur traders and hunters. The pattern of this economy is well known. By reason of the climate, characterized by short, hot summers in which most of the scanty precipitation is received, and by long, dry winters, most of the arable land is used for the production of cereals. Wheat is the major crop, being grown almost exclusively in the south-central short grass plains and together with other cereals, mostly barley and oats, in the parkland and wooded areas. Of the 60,850,000 acres of improved farm land in the Prairie Provinces in 1937, cereal crops were grown on 38,320,000 acres, while an additional 17,850,000 acres were under summerfallow in preparation for cereals. These totals represent slightly over ninety-two per cent of the cultivated acreage. The large acreage under summerfallow characteristic of dry-land farming, is imposed on prairie agriculture by the twin necessities of controlling weeds and storing soil moisture as insurance against abnormally dry seasons. During the seventeen-year period, 1921 to 1937 inclusive, the total value of wheat, barley and oats produced was in excess of $5,989,000,000. In addition to cereal culture, the Prairie Provinces support a large live-stock industry with 3,900,000 head of cattle, 1,300,000 sheep and 1,900,000 horses. The total acreage of pasture land, mostly unbroken range, is over 35,000,000 acres.

The entire farming industry in the Prairie Provinces was conducted in 1939 on some 300,000 farms, with a capital value of land, equipment and live stock of $1,770,000,000, and a total production estimated at $481,603,000. Such is the outcome of the experiment in colonizing Western Canada.

The Drought Crisis

During its period of development, prairie agriculture has suffered many set-

Left:—Before soil drifting cultural measures were applied.
Right:—After soil drifting cultural measures were applied.

backs, but none so severe as that which accompanied the eight-year period of drought between 1929 and 1938. Throughout that period, repeated crop failures arising from unprecedented conditions of drought and soil drifting have been experienced over an extensive area covering south-western Manitoba, southern Saskatchewan and south-eastern Alberta. The area affected coincided almost exactly with Palliser's "arid" triángle and contains over one-half of the farms in the Prairie Provinces. Furthermore, this drought period occurred simultaneously with the world-wide economic depression which started in 1929. The combined effect of drought and depression was devastating. Within the territory most severely affected, the farm income from wheat, the principal crop, declined by an average of seventy per cent during the years 1930 to 1937 inclusive. In 1937, the worst year of drought, the average yield of wheat in Saskatchewan was only 2.6 bushels per acre as compared with a long time average of 15 bushels.

As a result of the foregoing conditions a very large number of farmers in the affected area suffered heavy losses and experienced hardship and even destitution. Many people abandoned their holdings to seek new homes in more favoured sections, the resulting internal migration assuming considerable magnitude. Much of the abandoned land, unprotected by crop or grass growth, became subject to soil drifting to the detriment of neighbouring occupied land. Shrinkage of income rendered many farmers incapable of dealing with the soil drifting menace, or even of continuing normal farming operations. In whole municipalities the capital value of the community farm enterprise declined to less than its mortgaged indebtedness. Large governmental expenditures for relief, and to enable farmers to continue operations, became necessary. Under such circumstances the economic structure of the region was subjected to severe strain, and social services were threatened with disruption.

The nation-wide repercussion of the drought crisis led the Dominion Government to introduce various measures for the alleviation of distress and the reorganization of agricultural economy in the affected region. One of these measures was the rehabilitation programme initiated in 1935 by the Prairie Farm Rehabilitation Act (P.F.R.A.).

The Prairie Farm Rehabilitation Act

Under the terms of this Act the Dominion Minister of Agriculture has been authorized to promote such systems of farm practice, tree culture, water development, land utilization and land settlement as would afford greater economic security to farmers located in the drought area of the Prairie Provinces. Within this range of objectives may be included all problems encountered in the technique of prairie farming.

By the end of March, 1940, the P.F.R. Act had been in force for five years. Expenditures under the Act during this period amounted to $9,794,597.37.

Work under the Act has been organized in the following major phases:

1. Cultural — covering all matters pertaining to farm practices and the production of crops and live stock.

2. Water development — the improvement of water supplies for domestic, stock-watering, and irrigation purposes.

3. Land utilization — aimed at creating an optimum relationship between soil type and agricultural enterprise.

During the early stages of development all phases of P.F.R.A. work were conducted by the Dominion Experimental Farms. Latterly, a separate organization has been set up at Regina, Saskatchewan, to handle water development and land utilization. The following description deals principally with cultural phases of the work conducted by the Dominion Experimental Farms.

The Dominion Experimental Farms and the P.F.R.A. Programme

The need for research in prairie agriculture received the early attention of the Dominion Government, and led to the establishment in 1888 of Dominion Experimental Farms at Brandon, Manitoba, and at Indian Head, Saskatchewan, the former serving the settled areas in Manitoba and the latter the newly-opened Northwest Territory. These Farms were units in the Dominion Experimental Farms System, founded in 1886. Subsequently, as prairie settlement progressed, additional units of this system, known as Dominion Experimental Stations, were established at Lethbridge, Alberta, n 1906: Lacombe, Alberta, 1907; Rosthern, Saskatchewan, 1909; Scott, Saskatchewan, 1911; Morden, Manitoba, 1918; Swift Current, Saskatchewan, 1921; and at Melfort, Saskatchewan, 1935. Since 1927 the important ranching industry of Western Canada has received special attention at the Dominion Range Experiment Station, Manyberries, Alberta.

Lower left:—Soil research laboratory, Swift Current, Saskatchewan.

Lower right:—The year before this crop was harvested (1938), this land was considered useless for crop production by reason of aridity. Irrigation project, Val Marie, Saskatchewan.

Since 1915 demonstrational work has also been conducted on Illustration Stations established on private farms in many districts. In support of this system of Farms and Stations there has been a highly trained organization of chemists, botanists, plant pathologists, plant and animal breeders, entomologists and other specialists.

From the foregoing enumeration it will be observed that the development of the Experimental Farms has kept pace with prairie settlement. For this reason they have been highly useful in enabling prairie farmers to profit from past experience, deal with new problems as they emerge, and anticipate future developments.

Among the many early contributions of the Experimental Farms to prairie agriculture were the introduction of the summerfallow for soil moisture conservation, the conquest of the early frost hazard by the development of Marquis wheat and other early maturing crops, and a vast array of essential adaptations of eastern farm practices to prairie conditions.

On the inauguration of the P.F.R.A. programme in 1935 the Experimental Farms formed an ideal organization, ready at hand for the conduct of rehabilitation work. The execution of the programme devolved principally on the Farms in the drought area, located at Brandon, Indian Head, Swift Current, Scott and Lethbridge. With these Farms as centres, the cultural phases of rehabilitation work are conducted through the following agencies:

District Experiment Sub-Stations

These sub-stations are essentially large Illustration Stations on which the results of Experimental Farm work are subjected to further trial under ordinary farm con-

ditions. Comprising usually some 640 acres of land, these sub-stations are private farms operated under government supervision. Since there are forty-six of these sub-stations in operation at strategic locations, they bring farmers into close touch with the latest developments in dry-land farming.

Reclamation Stations

Investigational work on the reclamation of abandoned land, either for crop production or grazing, has been conducted at seventeen points throughout the drought area. These projects, ranging in area from 150 to 3,200 acres, have been productive of invaluable information on methods of controlling chronic soil drifting and remedying its adverse effects on soil fertility.

Regrassing Demonstrations

These demonstrations which are, in effect, experiments to determine the best methods of seeding grasses on weedy or overgrazed land, have been started in co-operation with farmers at 600 locations. They vary in size from about 10 to 640 acres with an average of about 18 acres each.

Agricultural Improvement Associations

There is no more essential function of rehabilitation work than that of securing direct co-operation between farmers and governmental agencies and among farmers themselves. Agricultural Improvement Associations (A.I.A.'s) to the number of 204, with 32,000 members, have been formed for this purpose. These associations receive moderate financial and material support from the Government, and the full advisory services of the Experimental Farms. The very considerable improvement in farm practices which has been effected on the prairies in recent years is largely attributable to the co-operative and educational activities of the A.I.A.'s.

Special Activities

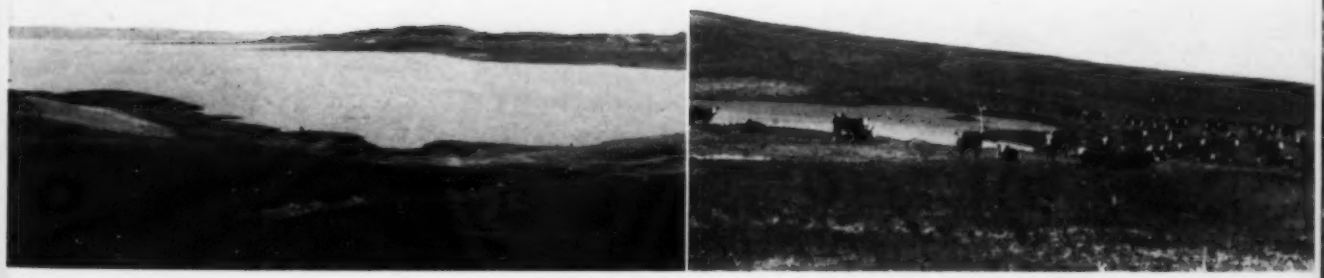
The activities described above are under the regional supervision of each Experimental Farm engaged in P.F.R.A. work. In addition, there are a number of activities for which special facilities are required.

Tree Planting — Extensive tree-planting operations, mainly of farmstead shelterbelts, are conducted by the Experimental Farms Service from the Forest Nursery Station at Indian Head, Saskatchewan. Supplies of planting stock are produced at this station and a subsidiary station at Sutherland, Saskatchewan. Large-scale tree planting experiments to ascertain the hitherto undetermined effect of extensive shelterbelt plantations on crops and soil are being conducted in co-operation with Field Shelterbelt Associations at Lyleton, Manitoba, Conquest, Saskatchewan, Aneroid, Saskatchewan, and Ribstone, Alberta.

Since 1935 approximately 10,770,000 trees have been furnished for P.F.R.A. projects.

Soil Surveys — Soil and land classification surveys were established in Western Canada by the Soils Departments of the provincial universities. In view of the need for an accurate classification of soils in order that the results of experimental work might be properly applied, the Experimental Farms have assisted the univer-

Lower left:—Dam and water reservoir, Val Marie, Saskatchewan.
Lower right:—Small dam in the ranges. A bountiful supply of water distributed over range areas greatly increases their output.



Soil drifting control and shelterbelts with irrigation water from nearby dugout result in a good garden on this farm.

Field shelterbelt near Indian Head, Saskatchewan. An excellent crop due to snow conservation.

sities in accelerating these surveys. Altogether, including work done prior to 1935, some 98,500,000 acres or over ninety per cent of the land within the P.F.R.A. area have been covered by soil surveys.

The results of these surveys are being used increasingly as the basis of new P.F.R.A. work, such as the selection of sites for sub-stations, reclamation projects, and in land utilization measures.

Soil Research — Problems of soil moisture utilization by crops and methods of moisture conservation led to the establishment, in 1921, of a laboratory at Swift Current, Saskatchewan. Marked contributions to the knowledge of plant and soil relations in semi-arid regions were made in this laboratory, and the fundamental facts secured led to notable improvements in the technique of dry-land farming.

With the inauguration of the P.F.R.A. programme, a new and enlarged Soil Research Laboratory was established at Swift Current for more intensive research into fundamental problems of moisture conservation, soil drifting control, and various fertility problems.

Co-operative Soil Research — With a view to utilizing the research facilities of the provincial universities, certain problems relating to prairie soils are being investigated as co-operative projects.

Plant Breeding — Plant breeding work is a major phase of Experimental Farm work through which material contributions have been and are being made to prairie agriculture. In wheat production this programme was no doubt greatly stimulated by the absolute necessity for creating a high-quality rust-resistant wheat. Plant pathologists and cereal breeders worked together in discovering the various new forms of plant diseases, the susceptibility of existing varieties thereto, and in laying out a programme of plant breeding leading toward a solution of these problems. New hybrid wheat, oats, and other cereals with marked resistance to the worst of the plant diseases, as well as to drought and insect pests, are being continually evolved and thoroughly tested. Earliness and quality with high yield and adaptability to different soil types are still, of course, major factors in the plant breeding programme as they were in the earlier days.

Meanwhile, forage crop work received its proper recognition as a major field of experimental activity. The discovery of western rye grass and the introduction of many new dry-land species of grasses, including brome grass, were earlier accomplishments of great value. Later, the introduction of crested wheat grass with its adaptability to very dry-land conditions was a still further step forward in providing a species of grass of outstanding worth to the drier sections of the Prairie Provinces. The multiplying of this and getting it well established in commercial production was under way at the time of the passing of the P.F.R. Act.

A still further accomplishment was the creation and multiplying of a non-creeping type of brome grass.

A corn breeding programme, especially for southern Manitoba and Saskatchewan, produced early and high yielding hybrids and varieties. In the driest years this crop provides protection in summer against soil drifting, while the high stubble is of equal value in winter toward preventing snow and soil drifting.

Work on the improvement of grasses, legumes and other forage crops is conducted at the Dominion Forage Crop Laboratory at Saskatoon, Saskatchewan.

Grazing Surveys — For the most effective use of grazing lands, especially those which are sub-marginal for cereal production, extensive surveys of herbage conditions are in progress. This work is conducted from the Swift Current Experimental Station. Approximately 2,500,000 acres of range land have been surveyed.

Co-operating Agencies — Full co-operation is maintained between the Experimental Farms and other branches of the P.F.R.A. organization, as well as with various departments of the Provincial and Dominion Governments.

Progress of the P.F.R.A. Cultural Work

The principal problems facing the Experimental Farms in rehabilitation work are:

1. The production of crops under conditions of scanty and irregular rainfall.
2. The control of soil drifting.
3. The proper use of land.
4. The improvement of living conditions on farms.

The progress made by the Experimental Farms in finding and applying solutions to these problems is outlined below:

1. *The Production of Crops under Conditions of Scanty and Irregular Rainfall* The problem has been, and still is, the

principal subject of investigation of Dominion Experimental Farms within the Prairie Provinces. A few major lines of work in this regard may be noted.

Fertilizers — The use of fertilizers as an aid in combating drought is a factor worthy of consideration. As far back as 1900 commercial fertilizer studies were well established on Experimental Farms and with varying results depending on the type of soil and annual precipitation. Later studies were made as to methods of applying fertilizers. The improved methods corrected many of the inconsistencies that had appeared in the earlier experimental results. A joint and large scale experiment to study the use of phosphate fertilizers throughout the Prairie Provinces was established by Consolidated Smelters, the Provincial Departments, the Universities and Experimental Farms. These carefully selected trial plots were operated for a period of three years and showed in certain districts the amazing value of a small amount of fertilizer.

Implement Studies — During the last twenty-five years Experimental Farms have attempted to study carefully all new types of farm machinery which were on the market and might be of economic value to the commercial producer. Later on this grew to the proportions of considerable investigational work, particularly at the Experimental Station at Swift Current. New uses for standard machines, suggested changes in machinery, and the devising of entirely new machines, have gone far toward lessening production costs and providing information as to the effects of various machines in the handling of both soil and crop.

Weed Control — Weed control is obviously one of the most important reasons for summerfallow, yet the very methods which were commonly used for the killing of weeds simultaneously pulverized the soil and otherwise stimulated soil drifting. For this reason a special Weed Sub-Station was established at Regina to secure information as to the methods best suited to eradicate, or at least control, the worst weeds. Later, the additional factor of retaining a trash cover and a lumpy surface in the handling of summerfallow or land to be seeded gave information of outstanding worth when the Experimental Farms were called upon to assist in planning a cultural programme for soil drifting control.

2. The Control of Soil Drifting

The fundamental cause of soil drifting is low rainfall and high winds. In the Prairie Provinces the danger of drifting is increased by the large acreage of land in cultivated summerfallow. These facts have long been well known. During the drought period, however, it became more fully apparent than formerly that the susceptibility of prairie soil to wind erosion increases with the period it is under cereal culture. Thus the problem of soil drifting control becomes increasingly complex and pressing. Several measures for the control of drifting have been promoted or introduced by the Experimental Farms.

Strip Farming — This practice consists of growing crops in long narrow strips in alternation with similar strips of summerfallow. By this means the danger of drifting on fallow land is minimized. Soil drifting became a menace in Saskatchewan and Alberta over twenty years ago. More by accident than by research the discovery was made that strip farming had a marked influence in curbing soil drifting, yet still allowed the summerfallow to be used in moisture conservation and weed eradication. This discovery at Monarch, Alberta, gradually became known in other districts in that province, and soil drifting was definitely controlled up to the year 1934. Previous to that date, however, farmers in the Shaunavon, Gull Lake and other districts in Saskatchewan, faced similar severe problems in soil erosion. It was only by the adoption of the same practices found at Monarch that any reasonable control was established. However, in the application of strip farming to soil drifting, certain limitations became apparent. A close study of cultural methods through research work and the careful observation of experimenters and practical farmers established the necessity of coupling with strip farming cultural measures which would at all times leave the lumpiest possible surface, and, at the same time, retain near the surface all trash which could be used to hold the soil together mechanically. The demonstration on District Experiment Sub-Stations of strip farming and allied practices has led to the extensive adoption by farmers of these practices, especially in southern Alberta and south-western Saskatchewan. In these districts, drifting which has occurred on millions of acres is now under control and is unlikely to recur.

Abandoned farm home near Weyburn, Saskatchewan.

Field Day for farmers on a Sub-station.

Heads of crested wheat grass in bloom. An important new dry-land grass useful for reclaiming abandoned land. Crested wheat grass is a native of western Siberia.

Regrassing — Scattered areas of light soil constitute, when cultivated, a drifting menace to adjacent land, and are in themselves of little value for crop production. The solution of this problem lies in re-establishing a grass cover on these areas and using them for grazing or the production of hay. To this end there have been distributed over one million pounds of grass and forage crop seed, mostly crested wheat grass, for seeding down sub-marginal areas. The bulk of this distribution has been through reclamation and regrassing projects and through A.I.A. channels. In this manner, thousands of focal points of drifting have been covered with grass, grazing established on land formerly of no value, and many farmers became acquainted with the technique of regrassing with which they had no previous experience.

To assist in the reclamation of severely drifted land, a new technique has been evolved. This consists largely of the temporary control of drifting by deep furrowing, seeding rye when weather conditions are favourable for quick germination, and regrassing when a good stand of rye is secured. On some reclamation stations this procedure has had to be repeated several times before success has been secured.

Through the foregoing and many other adjustments in cropping practices the P.F.R.A. has been instrumental in very greatly reducing the losses incurred by prairie agriculture from soil drifting. The severity of damage from drifting and the effectiveness of P.F.R.A. remedial measures, especially as regards A.I.A. activities, have created among prairie farmers a profound degree of alertness to all phases of the drifting problem. For this reason a repetition of conditions experienced in recent years is very improbable.

3. The Proper Use of Land

Long before the drought crisis it was apparent that settlement had taken place on many areas which were sub-marginal for crop production. In many cases such settlement occurred during unusually favourable years, when even poor land produced good crops. Under normal weather conditions such holdings were unprofitable while the drought crisis rendered them untenable, and large scale abandonment and internal migration resulted. To turn the abandoned land to some useful purpose and to find new areas of settlement were problems confronting both Dominion and Provincial Governments. Much of the resettlement took place in northern districts, outside of the P.F.R.A. area, but the use of abandoned land and some resettlement became objectives of the rehabilitation programme. The principal methods of attaining these objectives have been the establishment on abandoned land of Community Pastures, and the resettlement of some of the diplaced farmers on irrigation projects. This work is performed by the Prairie Farm Rehabilitation Administration at Regina with some assistance from the Experimental Farms.

Community Pastures — These pastures have been established on sub-marginal

areas to provide grazing facilities for neighbouring stock raisers. By the end of 1939 some thirty-nine pastures had been established and work was proceeding on ten more. The total acreage involved was slightly over one million acres. The average pasture covers about 20,000 acres.

It is reasonable to assume that the establishment of Community Pastures, whereby sub-marginal land is withdrawn permanently from cultivation, will make an asset of such land which was formerly a liability. Community Pastures, under the P.F.R.A. programme, become centres of breed improvement, efforts being made to limit male stock on each pasture to one selected breed. Eventually it is planned that each pasture will come under the control of local farmers, acting through a Grazing Association.

In connection with the improvement of grazing conditions on Community Pastures, the Experimental Farms have conducted grass seeding operations on 57,000 acres of abandoned land in Community Pastures.

Irrigation — Early in the present century considerable development in irrigation took place in southern Alberta, utilizing water from the Rocky Mountains. Much of this development involved large projects, costing millions of dollars, and was designed for grain and sugar beet production. At present about 400,000 acres are irrigated in these projects.

Irrigation development under the P.F.R.A. programme has differed from the older projects in Alberta in several important aspects. P.F.R.A. projects have been relatively small, ranging from a few acres on private farms to five or six thousand acres in community projects. Costly construction, especially for canals, has been avoided. The main difference, however, is that P.F.R.A. irrigation projects have been designed for the production of forage crops in grazing territory, with a view to securing supplementary and reserve supplies of feed for the stabilization of the range industry. Some forty large and over eight hundred small projects, designed to utilize run-off water for the irrigation of forage crops, have been constructed by the Water Development Branch of the P.F.R.A. Administration at Regina. The irrigable acreage involved is in the neighbourhood of 200,000 acres, distributed, for the most part, in intimate relation to the grazing territory. In this manner, the carrying capacity of large tracts of range land, hitherto limited by lack of water and feed reserves, has been considerably increased and relieved from the hazards arising from scanty and variable rainfall.

Rough surface cultivation showing clods and trash cover which prevent drifting.

A second benefit of the P.F.R.A. water development work is that it affords satisfactory resettlement possibilities. Many farmers, driven from their farms by drought and poor soil, are enabled, on irrigated land, to engage in the production of such forage crops as alfalfa, for which there is a local market, with no serious competition from dry-land farmers. The stabilizing effect of this factor on prairie agriculture is very great.

To irrigation development under the P.F.R.A., the Experimental Farms make some material contributions. For the selection of irrigable land and the solution of alkali problems, the services of soil surveys are supplied. Land in the larger projects is prepared for irrigation by experienced irrigators on the Farms staff. On smaller projects, farmers are assisted in the actual work of irrigation under a "follow-up" scheme. The background of this work is found in years of experimental work with irrigation at the Lethbridge Experimental Station.

By the foregoing and similar methods, advantage has been taken of the opportunity presented by the drought crisis to correct some of the mistakes made in the early settlement of the Prairie Provinces.

4. *Improvement of Living Conditions on Prairie Farms*

In the final analysis, the permanency of western agriculture will depend essentially on a programme of developing permanent rural homes, and because of the high wind and consequent high evaporation of soil moisture, even without soil drifting, trees become indispensable. In the earlier days of the Experimental Farms, the introduction of new and drought-resistant types of trees and shrubs was part of the regular programme of work. These were tested at various Branch Farms and their value rapidly established. Large scale propagation of trees for prairie planting was undertaken by the Dominion Department of the Interior. Two nursery stations were established at Indian Head and Sutherland, Saskatchewan. In the year 1932 these Stations became units of the Dominion Experimental Farms. The access to free trees and shrubs and advice as to the methods of building shelterbelts, which have been given freely to farmers through the three Pairie Provinces, has been of inestimable value. Some 200,000,000 trees have been thus distributed, and under the P.F.R.A. programme this work is being still further enlarged.

Shelters for homes, thus provided, allow, with a great deal of security, the protection of first-class gardens. For over forty-five years Experimental Farms have been carrying on an intensive breeding programme toward obtaining hardy tree and bush fruits and early maturing vegetables. Marked progress was made and the products were made available to farmers both through the Experimental Farms and through the nursery and seed trade. Twenty years ago this work was expanded to the establishment of a special Horticultural Station at Morden, Manitoba. At a still later date, the Experimental Station at Rosthern, Saskatchewan, expanded horticultural work along these lines.

The almost complete dependence of many prairie farmers on income from grain crops has resulted in hardships when such crops have failed, but the climatic factors which imposed cereal culture have excluded mixed farming. The obvious solution is to raise sufficient garden and live-stock produce on each farm to supply domestic needs — to engage in sustenance farming.

Under the P.F.R.A. programme sustenance farming is being promoted by various measures. Gardens and tree planting have been noted above. In connection with gardens, an interesting development might be cited. In 1939 parcels of eye sets of certified seed potatoes were distributed by the Experimental Farms to over 19,000 A.I.A. members, with the object of promoting potato culture in a small way on a large number of farms. From this distribution some 17,000 bushels of good seed potatoes were harvested, thereby enabling several thousand farmers to start potato plots in 1940. Thus, at moderate cost to the Government, the dependence of prairie farmers on outside sources of food is being materially lessened. By similar methods, other phases of sustenance farming are being promoted. The improvement of living conditions and independence from outside supplies of certain foodstuffs on prairie farms is being effectively promoted through assistance given to farmers in the construction of water storage facilities. These consist of dams and dugouts in which sufficient spring run-off water may be stored to meet domestic and stockwatering requirements throughout the year. Assistance provided

for this purpose through the Water Development branch of the P.F.R.A. office at Regina includes engineering services and financial payments to cover part of the cost of construction. To the end of March, 1940, some 3,454 stockwatering dams and 9,945 dugouts had been constructed through the P.F.R.A. In addition 833 irrigation projects on private farms had been completed. The total cost of this work was $987,465.15, but the improvement effected on the private farms in terms of capital value, is probably in the neighbourhood of three or four million dollars. The betterment in living conditions brought about by dependable supplies is very appreciable.

The Future

This description of P.F.R.A. activities is necessarily brief and incomplete. Its purpose has been to show in what manner experimental science is influencing the development of prairie agriculture, which is in itself an experiment.

An interesting observation is that the territory covered by the P.F.R.A. is almost exactly the same as was included in Palliser's "triangle". This fact would indicate some sound basis for the estimates made of this country by both Palliser and Hind. On the other hand, the production within the triangle in the last twenty years of wheat, oats and barley, valued at nearly five billion dollars, supports the optimistic estimate of Macoun. In the evidence which supports these divergent views, the variable and hazardous conditions under which prairie farmers must operate are made clear. The function of the P.F.R.A. programme is to evolve that technique of farming which renders prairie agriculture capable of absorbing the disturbing effects of these variable and hazardous conditions. The success of this programme, already considerable, will contribute materially to the success of the Canadian experiment in prairie settlement.

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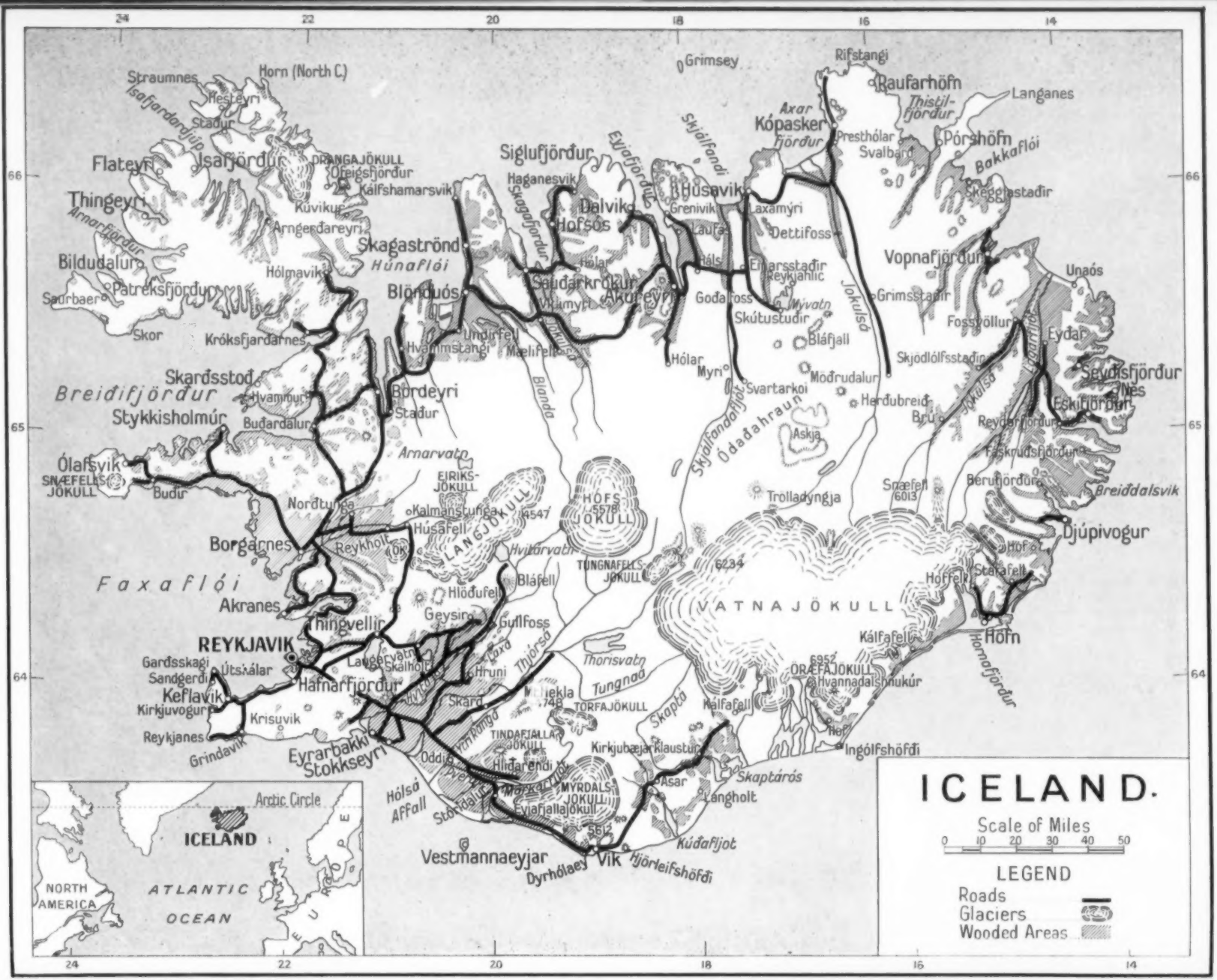
(1) Loose sandy drifted soil at Cadillac, Saskatchewan.

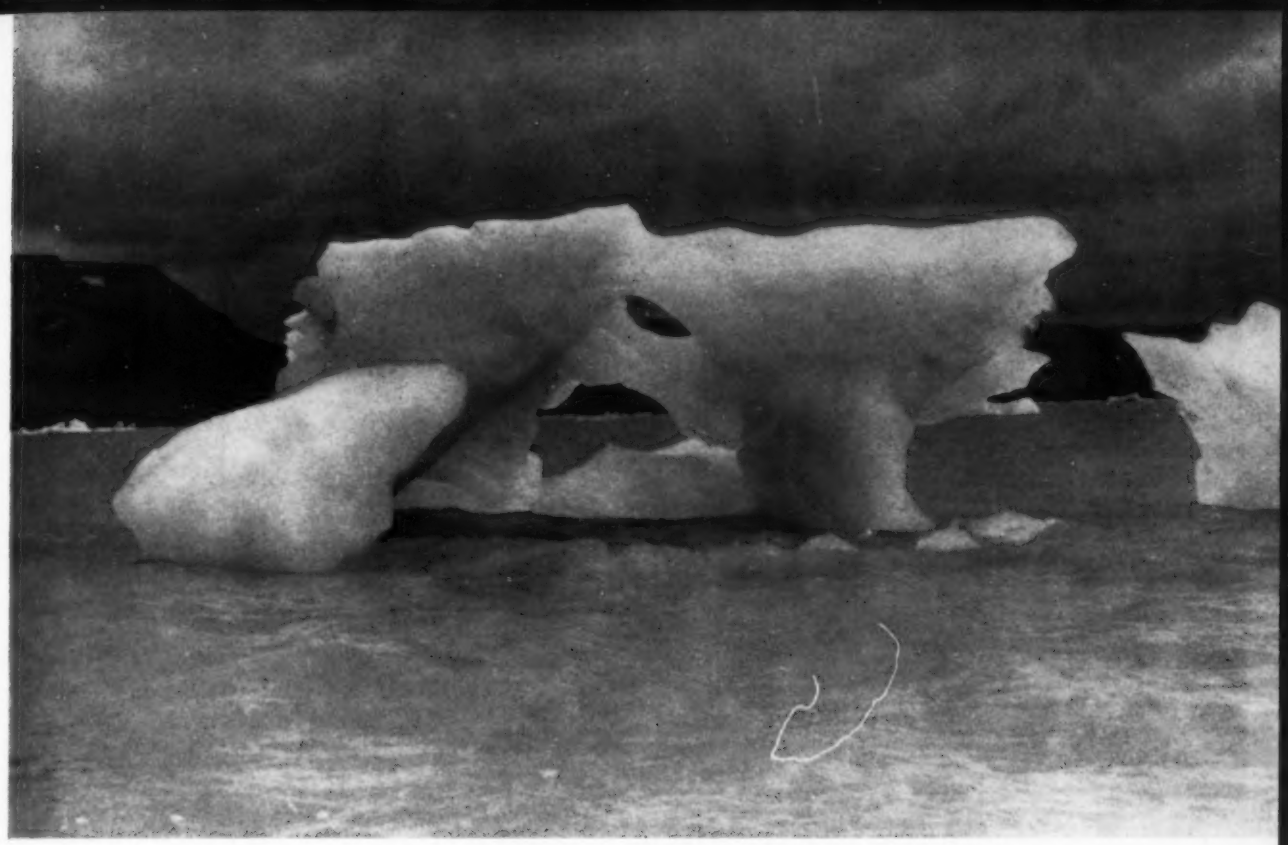
(2) This is how a once productive farm looks after a few years of drought and soil drifting.

(3) Concrete spillway on Arm River near Bethune. Built in the fall of 1937.

(4) Prairie garden near Indian Head, Saskatchewan.



CANADIAN GEOGRAPHICAL JOURNAL MAP



Small icebergs along the Icelandic Coast.

ICELAND "LAND of FROST and FIRE"

by **VIGFUS EINARSSON***

REMOTE from all other countries, in the middle of the Atlantic Ocean, a stepping stone between the New and Old World, lies Iceland.

It is the largest island in Europe after Britain, having an area of 40,000 square miles.

Iceland is a very mountainous country, consisting of basalt lava and other volcanic rock with, however, a large area of lowlands, especially in the south and the south-west. Otherwise there is very little lowland, except at the heads of the fjords and in the great many valleys which stretch from the numerous fjords and bays up into the highlands. Except for some rounded hills and shallow depressions the central part of the country is an unbroken plateau, eleven to twenty-six hundred feet high. In the interior, a great deal of the territory, especially the higher mountains, is covered with a cap of eternal snow.

Iceland is the most volcanic country in the world, and is, perhaps, most widely known for her volcanoes. Volcanic signs can be seen everywhere. Not only the mountains but great plains are covered with lava, often like a furious sea which has suddenly become stilled. This is something more than a simile, because the lava was once a roaring current of boiling rock. Over a hundred eruptions have been recorded since the country was first inhabited. In later years, however, volcanic eruptions have not been frequent, and most of them have taken place in the centre of the country far from human habitation.

The most famous of all volcanoes in Iceland is Hekla, a familiar name in every country. In former times this mountain was considered unmistakable proof of the existence of Hell. For several centuries people refrained from climbing Mount Hekla because it was believed to be the chimney of the dark abode underneath, but during later years it has become quite popular. A return trip to the top of Hekla, with a neighbouring farm as a starting point, takes ten to twelve hours.

*Ministry of Industries and Communications, Iceland.

CANADIAN GEOGRAPHICAL JOURNAL MAP

Many waterfalls are formed where the streams from the lava plateau plunge over its bounding escarpment. The lava banks show the typical columnar structure formed in many lava flows when they cool.

The view from the top is magnificent and well worth the somewhat strenuous trip, which is accomplished partly by the aid of ponies.

In Iceland there are many glaciers under which are volcanic craters in various places, as, for instance, in the western area of Vatnajökull, which, in recent years, has commanded attention on account of volcanic eruptions. A number of Icelandic and foreign scientists have climbed the glacier in order to investigate this peculiar phenomenon of ice and fire. It is fantastic to visualize these two opposing forces in conflict, fire breaking its way through hundreds of feet of solid ice.

Hot springs and geysers are to be found all over the country, even in the rivers, on the sea bed and under the glaciers. The most famous of all the hot springs is the Great Geysir about eighty miles from Reykjavík; from it spouting springs all over the world have derived their name. After having witnessed an eruption of the Great Geysir which lasted for twenty minutes, a Scottish captain remarked: "This power would have sailed half a dozen *Queen Mary's* right across the Atlantic". This unbroken column of scalding water and steam that rises from one hundred and sixty to one hundred and eighty feet up into the air is impressive and affords a spectacle never to be forgotten. The internal heat of the earth is a tremendous source of power. During recent years the Icelanders have been busy harnessing this heat and power. This is done chiefly by heating houses, buildings, swimming basins and greenhouses. Not only are a great number of individual farms heated by the

thermal springs, but certain public buildings as well, such as the larger country schools. It is of special interest for the traveller to note that many of these country schools are used as hotels during the summer season. In these places one can have outdoor and indoor swimming in warm water. The houses, in a considerable part of Reykjavík, are already heated by the thermal springs near the city, and we have reason to hope that a heating system of this kind will cover the entire city within a few months. After that no chimneys will be built in Reykjavík. The greenhouses, supplied with natural heat, are already busy procuring flowers as well as tropical fruit.

There are numerous rivers in Iceland and some of them have great volumes of water. Most of the larger ones have their origin under the glaciers and are of an opaque, greyish colour, on account of the glacial clay. Others rising from springs, are crystal clear. Most of the rivers are now spanned with bridges, but one can still imagine what it meant to ford them on ponies.

These huge rivers, rapid and powerful, sometimes run peacefully, although with a hidden strength, over fertile plains; sometimes plunge in tremendous falls, thundering on their way, and where the rivers drop down from the highlands, magnificent and beautiful waterfalls are formed. The most remarkable of these are Dettifoss in the north and Gullfoss in the south.

The water power in the country is enormous, and year by year it is being more and more utilized. At present it is giving light and heat to thousands of homes in Iceland. But the rivers in Iceland provide another asset; in a number of them the salmon are abundant, as are the trout in the many lakes in different parts of the country.

The lava-fields of Iceland are numerous and extensive, especially in the uninhabited part of the country, the most remarkable of these being Odàoahraun, the largest lava-field in the world.

Iceland has often been called "the land of contrasts" and it justly deserves the name. This is a land where the snow-white caps of the mountains cover the intense fire beneath, where you can take a bath in hot-spring water out in the open during the severe part of the winter; the inhabited valleys and plains are friendly, inviting and charming, the lava deserts desolate, barren and awe-inspiring. Beautiful lakes and rivers winding through green pastures and fertile meadows with

A waterfall formed where a stream drops into a crack in the lava plateau.

their gushing geysers are a sharp contrast to the sparkling glaciers, those fields of snow and ice, where no birds sing, and where nature is dead and silent except when the wind sweeps over the white desert.

The Climate

The name of the country and its geographical situation have given rise to the prevalent erroneous ideas about the island. Fortunately, however, there is very little similarity between the name and the country itself.

The climate of Iceland is a maritime climate: not particularly warm in summer and not very cold in winter. As for the temperature, it is interesting to note that the mean temperature in January in Reykjavik, the capital, is about 30 degrees Fahrenheit. The mean summer temperature is 52 degrees Fahrenheit. The mean temperature of the whole year is 39 degrees Fahrenheit, which is similar to Quebec. In Reykjavik we very seldom have snow, and on the lowlands snow rarely lies for long; on the mountains, however, it lies deep, making ideal conditions for winter sports.

The Population

And now, who are the people who inhabit this "land of frost and fire" as Iceland is sometimes called?

The people of Iceland are descendants of Scandinavian vikings who were full of vitality, eager in exploiting new countries and seeking freedom as Leif the Lucky, the Icelander who discovered America.

Iceland was colonized mainly by Norse vikings, who wanted to throw off the political yoke of Harald the Fairhaired of Norway. But a considerable part of the early settlers came from the British Isles, principally from Scotland and Ireland. The Icelanders are therefore a Scandinavian people with a mixture of Celtic blood.

Hrafna-Flóki was the first viking who intended to settle down in Iceland, but he left the country after a short stay, somewhat disappointed, as due to lack of foresight he gathered no hay for the sheep he had brought with him and therefore lost them all. Before he left the country he climbed a high mountain and saw a firth full of ice. This gave him the idea of giving the country the uninviting and rather misleading name it bears.

In the year 874 the first settler of Iceland, Ingólfur Arnarson, landed on the south coast of the country. Three years later he built his homestead where Reykjavík now stands. Reykjavík claims the distinction of being specially selected by the gods themselves to become the leading place of the country. According to the tradition, Ingólfur, when he sighted land, threw overboard his high seat pillars, declaring that he would settle down where the gods deigned to have them driven ashore. After a three-year search he found them where is now the harbour of Reykjavik.

Sixty years after the settlement of Ingölfur the population was about 50,000; these self-willed vikings made their homes here, becoming a nation of farmers and creating their own history and culture.

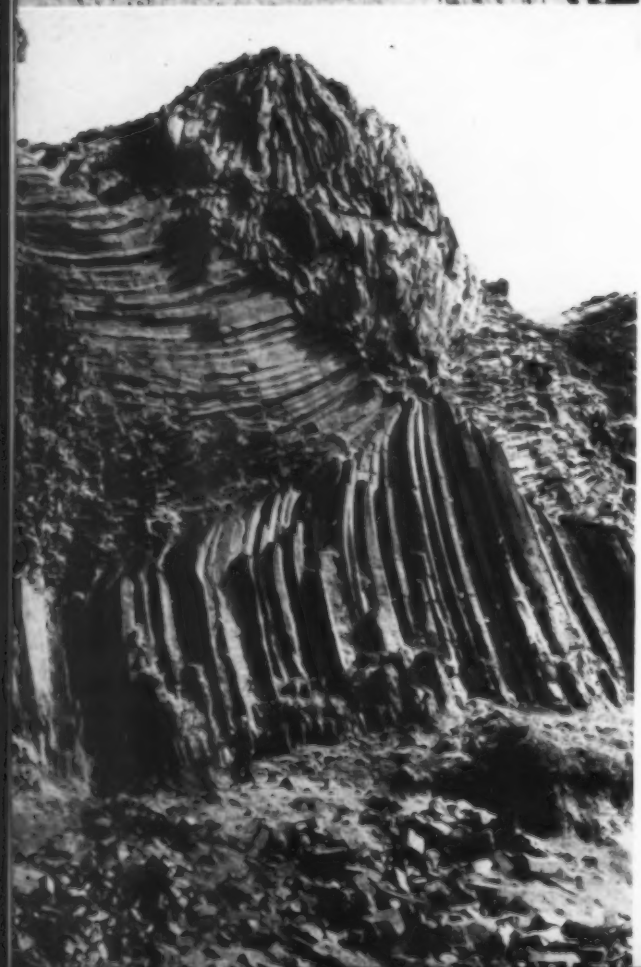
In the summer of 930 the people established a code of laws. This legislative assembly, the Althing, the oldest parliament in the world, used to gather every summer at a place called Thingvellir.

In the year 1000 the Christian faith was adopted by law. In the same year, Leifur, called the Lucky, discovered America, which he called Vinland. In commemoration of this event, the Congress of the United States of America presented Iceland with an impressive statue of Leifur the Lucky at the one thousandth anniversary of the Icelandic Parliament in 1930.

Left:—The end of two glaciers where they reach the sea.

Right:—Sheer cliffs rise from the sea in many places. The step-like benches are caused by erosion along the lines of contact of several basaltic flows.

Above:—Bringing the sheep from the mountains in the fall. Below:—A modern Icelandic farm. Left Top:—Fishing is Iceland's major industry. Barrels of herring at Siglufjördur ready for export. Left Bottom:—Ponies bring hay home to



The Language

Icelandic, the language of Iceland has remained pure and practically unchanged since the time when it was the common tongue of all northern people. Consequently, it might be called the mother tongue of the Scandinavian languages; a great many words in the English language are derived from this same source.

In Iceland there are no dialects, thanks to the national literature the Icelanders created long before any such thing was known in other parts of Northern Europe.

Early in the twelfth century the Icelanders began to write their laws and the history of their country on parchment, which was followed by the writing of the famous Icelandic "Sagas".

Political Relations

In the thirteenth and fourteenth centuries, through changes in political relations, Iceland became united first with Norway and later with Denmark.

The loss of political freedom, epidemics and widespread poverty and hardships for many years caused the population to diminish to about one-third of what it was at the time of the republic. But during the last few decades the Icelandic people seem to have taken on new life. In 1918, after a long and strenuous political struggle, Iceland became an independent and sovereign state in personal union with Denmark through a common king. Since the restoration of the power of administration, a steady and far-reaching change has taken place in the mode of living and general conditions in the country.

Fishing, Agriculture, Industry, Trade

The Icelandic nation is one of the smallest nations in the world (population about 120,000), but its influence in the world trade is felt far beyond what one might expect.

The greatest factor in Iceland's economic life is the fisheries. The sea around

Top:—One of the many geysers and hot springs of Iceland. The outflow of mud or mineral matter from the geyser has formed a series of stratified layers seen in the foreground.

Bottom:—Columnar or organ-pipe structure is common in the basaltic rocks. The cooling of the molten rock formed the cracks which separate the lava into blocks, often roughly five-sided.

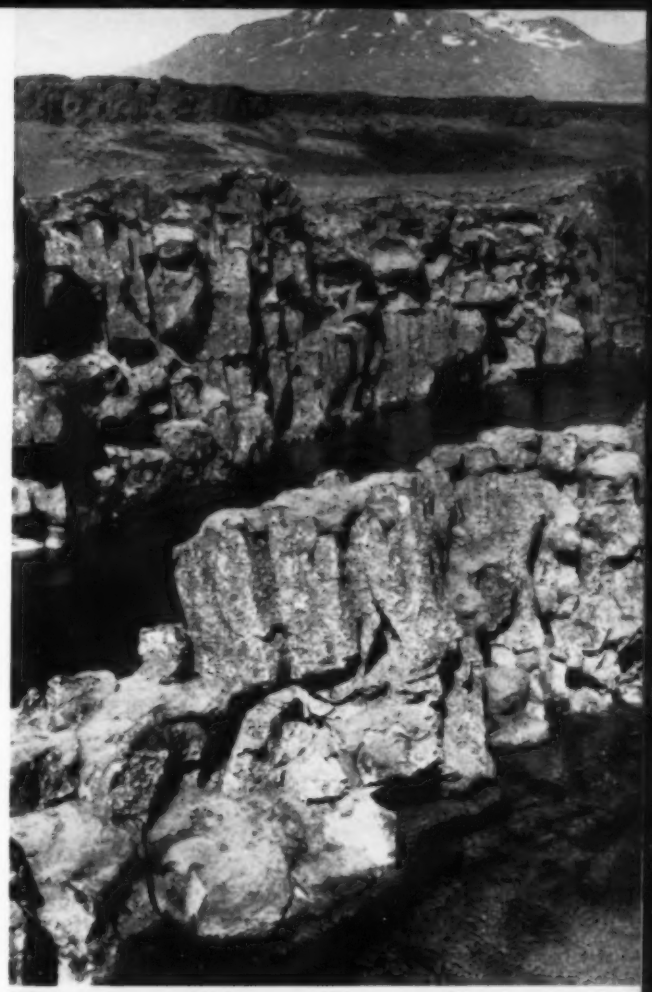
the country is enormously rich in fish. There are two currents striking the coast of Iceland. A branch of the Gulf Stream encompasses the larger part of the coast so that the country is almost surrounded by warm water. This is the reason the climate on this arctic island is much milder than one would expect when its geographical position is taken into consideration. The other current, polar in character, comes from the North and strikes the north and east coast of the country.

On account of these two currents with their different types of marine plant and animal life, the sea around Iceland is rich in the growth which is the basis of life for various kinds of fish such as cod, saithe, haddock, halibut, herring and many others. Seals are numerous and millions of seabirds breed and make their homes on the seashore, on the rocks and on the many small isles around the coast. The most important of these seabirds is the eider-duck, from the nests of which the eider-down is gathered.

The Icelandic fisheries are as old as the nation itself. For centuries the Icelanders used virtually only rowing boats. Later on came sailing vessels, which again, in their turn, were replaced by steam trawlers, other steamships and motorboats. Now the fishing is run on the most scientific modern lines.

But it is not only the Icelanders who enrich themselves with the abundance of the sea. There are thousands of ships of different nationalities fishing around the coast of Iceland. During the winter nights some of the fishing banks look like moving towns, light with light, ship with ship, all fighting for the cod. But the Icelanders are, of course, best situated for these fishing grounds, and indeed they exploit them with diligence, being the fourth largest fishing nation in Europe.

Agriculture, second largest occupation of the Icelandic nation has undergone a great change although the development has been slower than in the fishing industry. Stock raising is largely pursued,



Top:—The various lava flows have formed steps on the plateau. The higher mountainous region is seen in the background, with a pool of water in one of the cracks in the lava in the foreground.

Bottom:—The streams cutting the lava plateau are youthful and generally flow in canyons.

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1—There are many unusual erosional forms in the volcanic rocks of the island.

2—Travel, away from the few motor roads, is on horseback. Many scenic trips may be had in the vicinity of Reykjavík.

3—Icelandic ponies are sturdy and sure-footed.

4—A cavern formed in the volcanic plateau.

5—Snow covers the higher mountains where glaciers also exist in places.

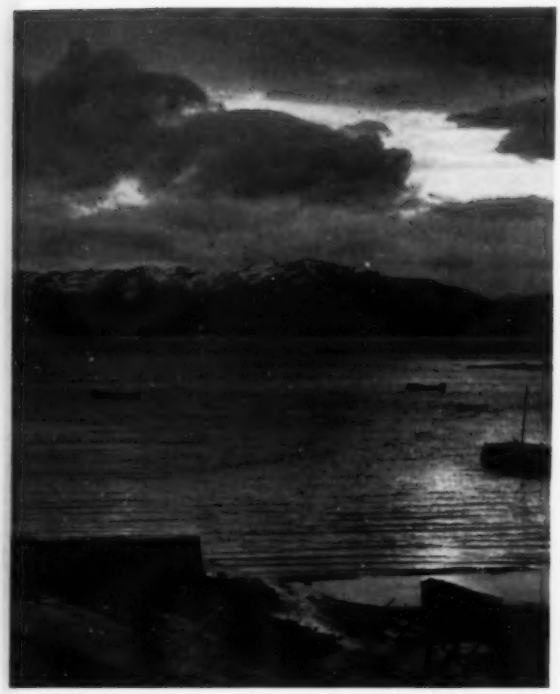
6—In one of Iceland's harbours.

7—A peculiar mushroom-like rock caused by erosion in the lavas and material ejected from the volcanoes.

8—Scenery on the plateau.

9—A waterfall formed where the stream plunges over the escarpment bordering the plateau.

10—One of the geysers in eruption. There are many geysers and hot springs in the island.



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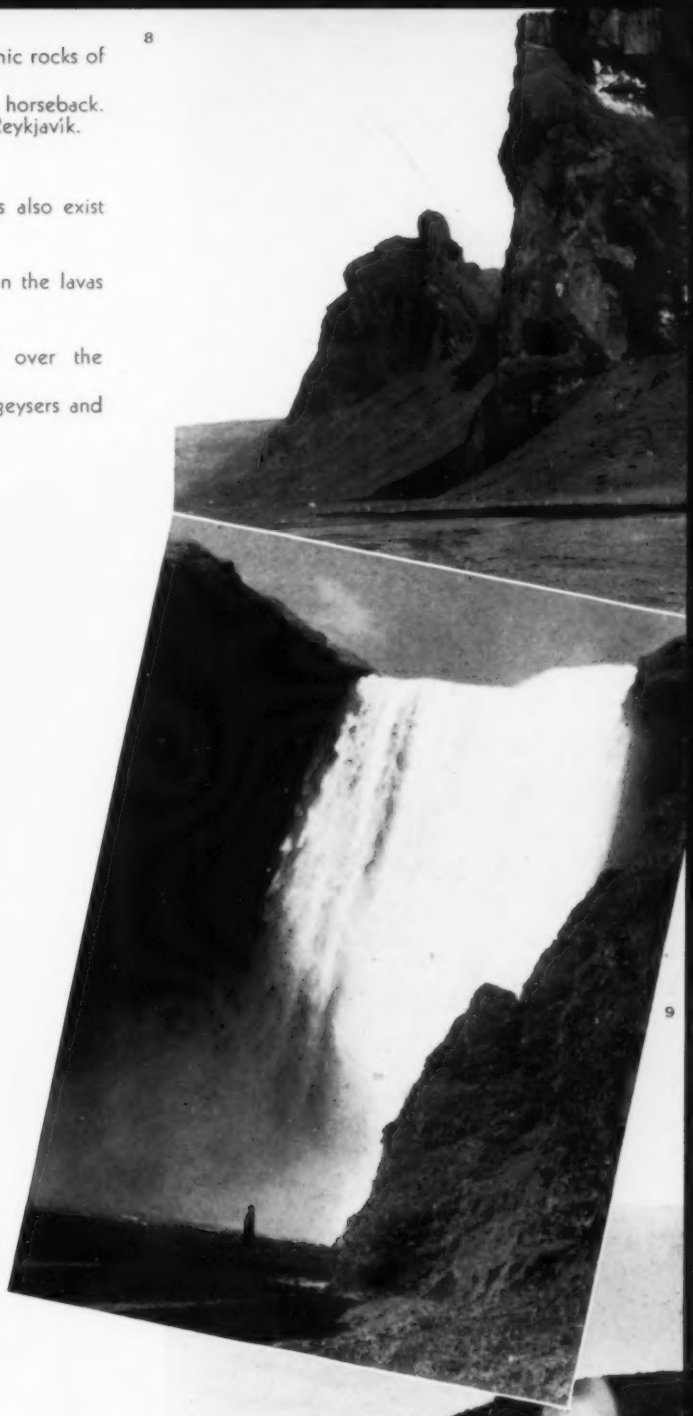

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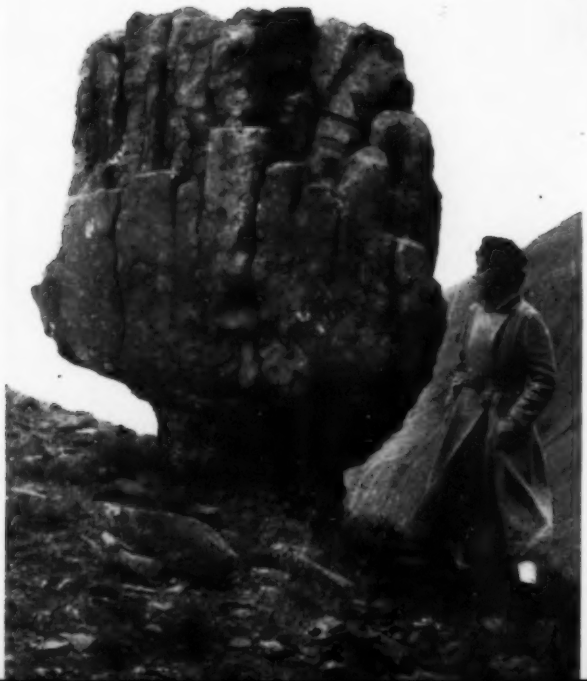

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Cones are built up around vents where lava or heated waters of the geysers issue. This material is deposited in layers.

the qualities of the soil being suited to it. The production of vegetables is considerable and increasing. An interesting feature of this occupation is, as has been stated earlier, the ever increasing use of natural heat from the thermal springs for growing all kinds of vegetables, fruit and flowers. The possibilities in this respect are practically without limit.

There is a considerable amount of industry in Iceland, particularly in connection with the fisheries, and it is increasing rapidly.

Trade, both at home and with foreign countries, is extensive in proportion to the size of the population. The foreign trade is greater per person than that of any other country from which statistics are available. This is because Iceland has need of a great many products for which there are no raw materials in the country. On the other hand, the products are somewhat one-sided. The exports consist mainly of sea products, such as fresh fish, frozen, salted and dried, herring, cod liver oil, fish-meal, and agricultural products such as meat, wool, butter, cheese, hides and skins, and eiderdown. Manufactured goods, groceries and all kinds of cereals have to be imported. In Iceland there are no mines, no coal, no salt or oil. These and all kinds of machinery must therefore be imported.

Communications

Communication is, as may be expected, rather difficult in Iceland. The country is mountainous and intersected by great rivers, but the population is small. Perhaps the first thing that would strike the visitor wanting to travel about in Iceland is the absence of railways. There have never been any railways in Iceland, and it is improbable that any will ever be built. Nevertheless, roads fit for motor traffic total altogether over 3,000 miles with about 330 bridges, of which the majority have been built during the last two decades. The roads cover most of the populated districts, linking them together across highland and mountain passes. Motor roads are also beginning to reach up into the highland plateau. Motor vehicles are the chief means of transport, and have replaced the horses. But travellers wanting to reach places outside the motor roads

Sink-hole depressions are quite common, either at the vents of geysers where the water wells out, or where gases escape from the heated interior.

Detail of the stratification around one of the cones.

have to resort to ponies, both for riding and transport of goods. The Icelandic ponies are the most delightful animals, they are strong, sure-footed and intelligent. As a matter of fact there are a great many who prefer the ponies to the motor vehicles, and it is difficult to imagine a more pleasant way of spending a holiday than by going with a group of friends on horseback through certain parts of Iceland.

Before the outbreak of the war passenger steamers sailed regularly from Iceland to England, Denmark, Norway and Germany. This is, of course, somewhat changed now, and two steamers have been put on the Reykjavik-New York route. Iceland hopes for improved communications with the American countries in the near future and wishes to establish a closer cultural and commercial relationship, particularly with Canada and the United States.

Telegraph lines extend over the whole country, and submarine cables, as well as a wireless telephone system, link Iceland with the rest of the world.

Education

Illiteracy is unknown in Iceland, and the general level of education is considered very high. Attendance in school is compulsory for every child up to fourteen years of age. In towns the school system is not unlike what is common in the English speaking countries. But in the country, schools have not yet been built in every district, so that in some places the teachers have to use the individual homes where the children gather. A number of schools for adults have been built in the country districts. These schools are preferably erected at the side of a hot spring, and are not only heated but are also equipped with swimming baths and even steam baths.

The University is small and a number of students go abroad to various European and American countries for special studies.

The art of writing seems to be a strong inheritance because a comparatively great number of people have shown their talent in this respect. Perhaps they are encouraged by the knowledge that if they have something to say and say it well, it will be read by a whole nation, even if a small one. Nowhere are so many books and newspapers published yearly in proportion to the size of the population, and, in addition, there is imported a great number of foreign books, for many people read one or more foreign languages. On the bookshelves in the farmsteads may often be seen a selection of world literature in the original languages.

An Icelandic girl.

Iceland as a Tourist Country

Iceland lies off the beaten track and has therefore not yet been discovered as a tourist country, except to a very limited extent. But the country has great possibilities in this respect. The number of tourists visiting Iceland has been increasing steadily in recent years and to those who love the open air and the pleasures and recreations afforded by nature, Iceland has much to offer.

* * *

Editor's Note: Although little known by most Canadians in the past, Iceland has suddenly become of great importance to this Dominion. Recognized as a possible jumping-off point for an attack on North America, this danger has been met by the establishment of a British Garrison in Iceland. This garrison includes units of the Canadian Active Service Force, with the result that the interest of many Canadians is being focused on Iceland for the first time.

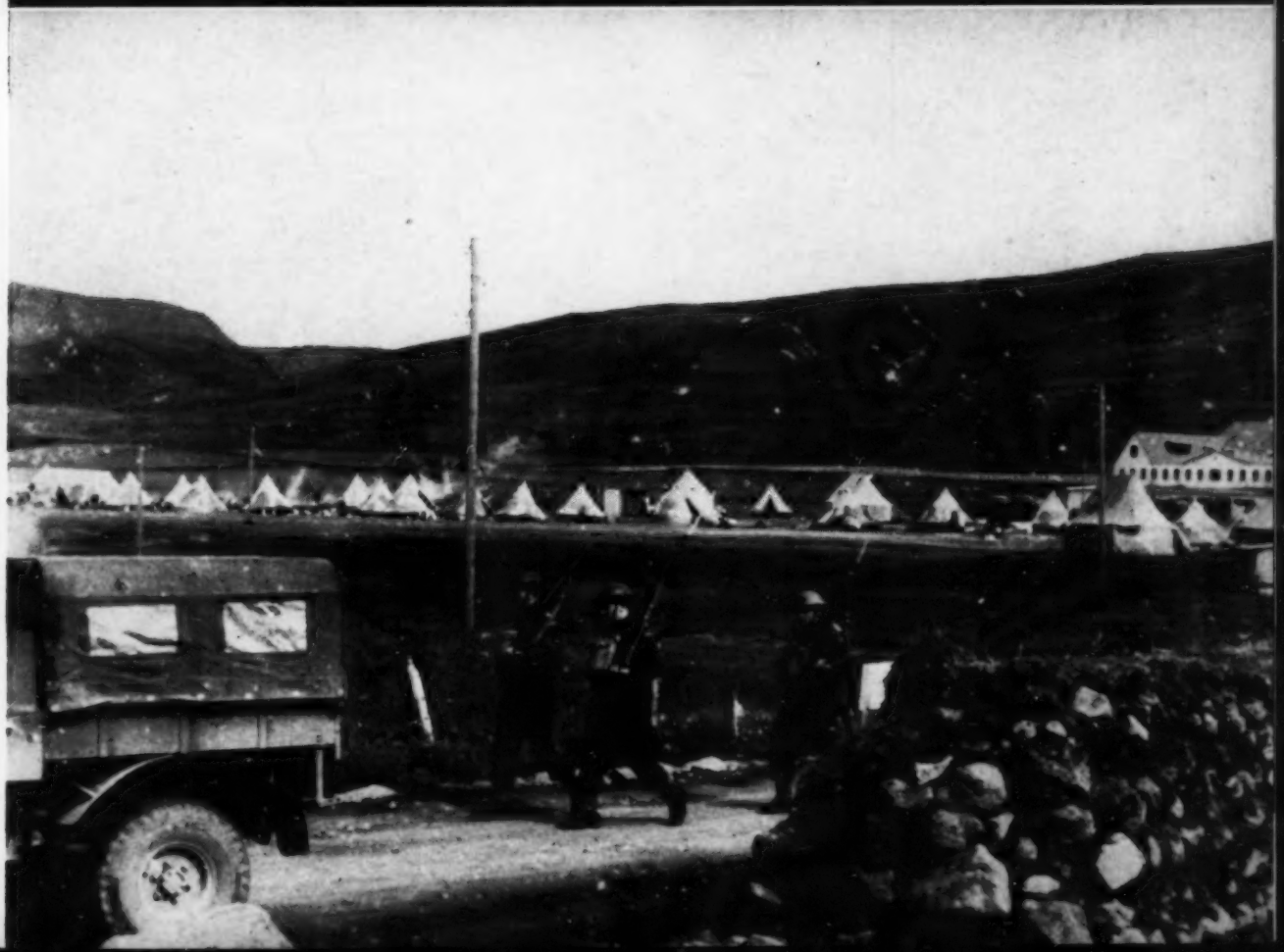
Pages 188 and 189:—Canadian and British troops in Iceland.

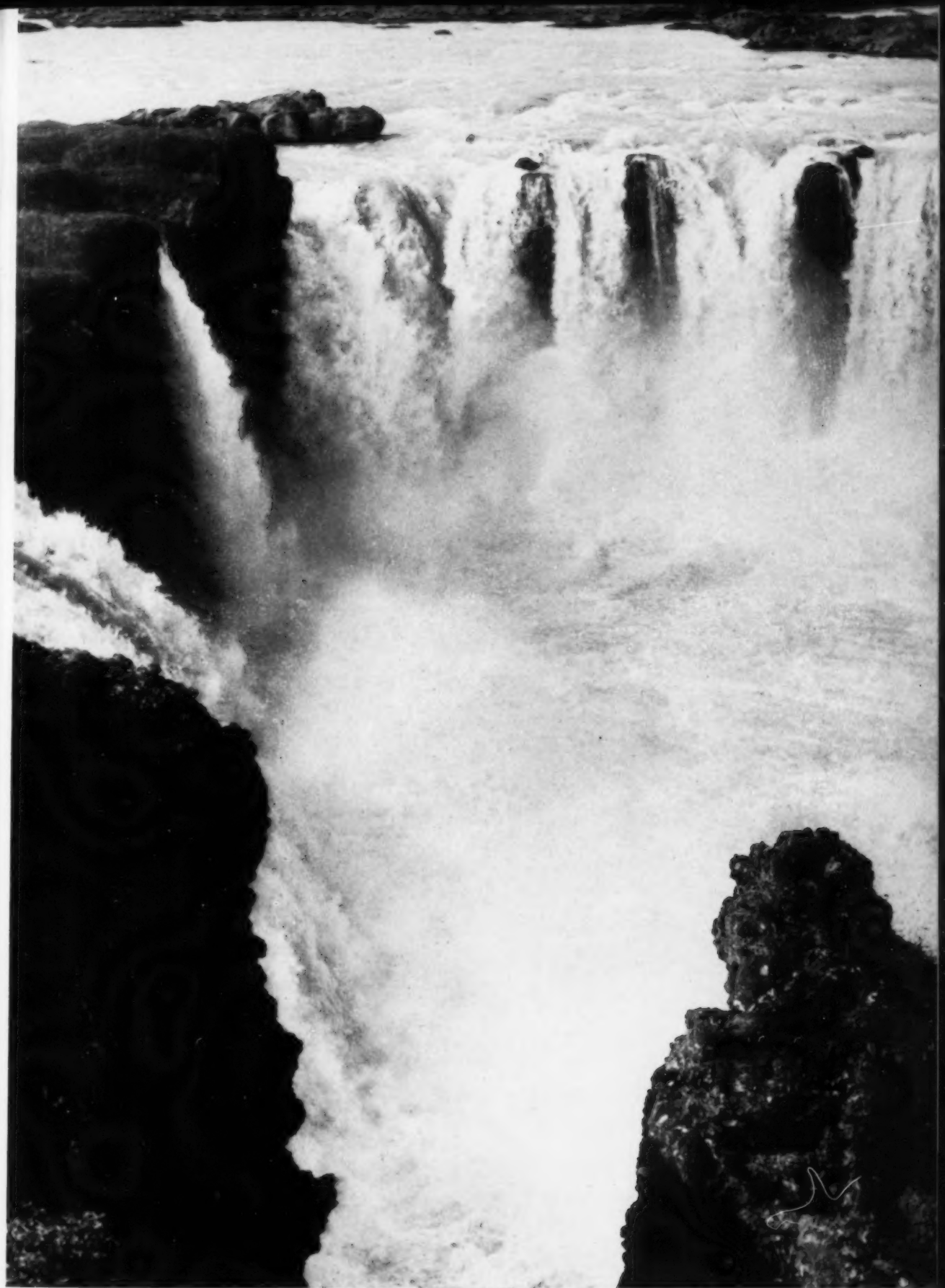
War Office photos. Crown copyright reserved.

Coastal scene in Iceland.

A stream in Iceland. Note the peculiar pinnacles due to erosion in the volcanic rocks.

Another coastal scene.





Above:—One of the numerous falls of the rivers in Iceland, formed where the waters from the upland plunge over the bordering scarp. These provide ample power for lighting and heating power plants.

Left:—A pool in a narrow joint crack due to the contraction of the lava while cooling.

ICELANDERS IN CANADA

by **S. J. SOMMERVILLE**

IN the interior of the Canadian West, there flourished for twelve years—1875 to 1887—what might be termed a miniature republic, self-governing in every detail, and transacting all its business of state in a foreign language. It met with no interference from the Canadian authorities and even received a visit from the Governor General, Lord Dufferin, in the fall of 1877, when highly complimentary addresses were exchanged by its leaders and His Excellency.

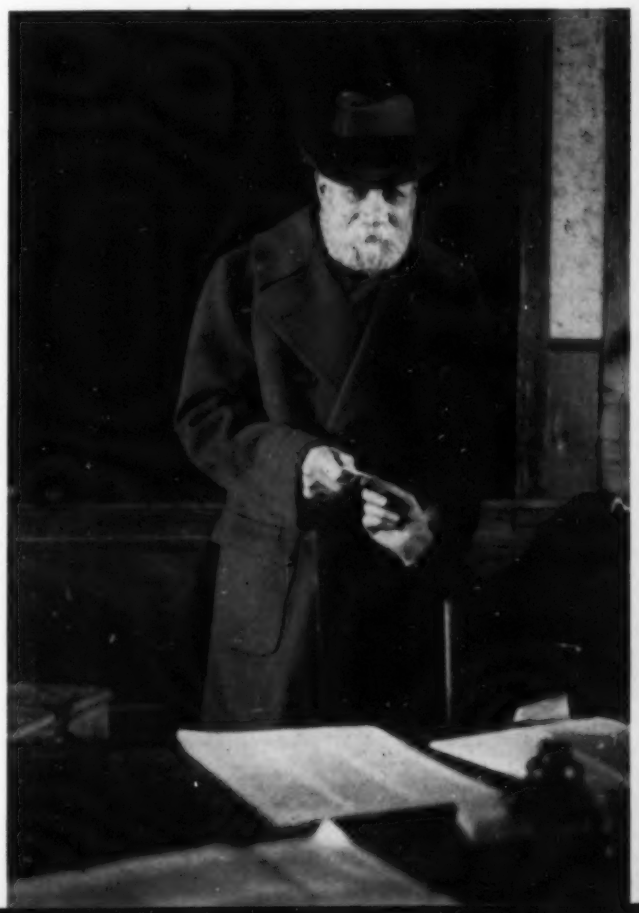
This was the first permanent Icelandic settlement established in Canada. It was located along the west shores of Lake Winnipeg, near the southern end. Letters addressed to its people bore the inscription: "New Iceland, District of Keewatin". Manitoba was still the "postage stamp" province and its northern boundary stopped at Boundary Creek, a few miles north of where the Red River empties into the lake.

All householders in the colony, property owners, or regularly employed men of "good character", over the age of eighteen, had a vote.

The articles of its constitution provided for taxation, road-making, education, charity, health and sanitation, fire services, wardship of orphans, the orderly settling of estates, practical assistance to widows, and arbitration and judgment in private disputes. Civic offices were defined and the duties of officials outlined. The whole was adopted in its final form at a specially called public meeting, January 11, 1878, and the details printed in the *Framfari*, the settlers' own newspaper, under date of January 14, 1878, published in Icelandic.

Both Canada and the United States were welcoming settlers to people the wilderness. Europeans had been pouring into the States, and, at the beginning of the "seventies", a few Icelanders had established themselves on Washington Island and in Milwaukee.

The spearhead of Icelandic immigration into Canada is believed to have been a lone young man, Sigtryggur Jonasson, who reached southern Ontario in 1872. A year later a group of slightly over one hundred Icelanders set up a colony at Rosseau, Muskoka, which, however, scattered within a short time, leaving only the name, Hekla, on the map as a reminder of their occupation.



Right:—Sigtryggur Jonasson, nonagenarian and first Icelander to settle in Canada, became a member of the Manitoba legislature, editor and publisher of Icelandic newspapers and leader of many of the early enterprises of his countrymen. Reaching southern Ontario in 1872 he was, two years later, entrusted by the Federal Government with the task of directing the settlement of Icelandic immigrants in this country, later being sent to Iceland as the Government's agent to bring out new parties of colonists. Mr. Jonasson now resides at Arborg, Manitoba.

Left:—Mrs. Jonas Stefansson, who, with her husband, was a member of the first historic party to reach the Gimli district. The log cabin in the background is a replica of the first homes. The spinning-wheel was made for Mrs. Stefansson in 1876 by Jon Ivarson, one of the colonists, on a home-made lathe, of local wood, the grooving done with a chisel made from a steel rasp. It is held together by wooden pegs, and the black stain which still endures was originally lamp-black.

In 1874, the Allan liner, *Patrick*, entered the St. Lawrence with 365 emigrants from Iceland, bound for the United States. They believed that human liberties and free institutions were much more likely to be respected in a republic than under a crown colony of Britain.

After much discussion through an interpreter, they agreed to try Canada, if the agent could promise them on behalf of the Dominion Government: (a) That they should have the same rights as other Canadians in every respect as soon as residential requirements were fulfilled; (b) That they be granted sufficient suitable land to establish a colony of their own; (c) That they and their descendants be free to retain their language, customs and way of living for as long as they wished.

The Canadian Government accepted this "Bill of Rights" and kept the covenant. The newcomers soon discovered for themselves that the only barriers against them were the invisible ones of ignorance of language and strangeness to the ways of the country.

The party wintered at Kinmount, Ontario, where intermittent bushwork and railroad grading paid labourers' wages. Living conditions were grim and all babies under two died.

Sigtryggur Jonasson, under appointment by the Federal Government, set out in the spring with a few of the men, to search through the Canadian West for a suitable settlement site. The strip along Lake Winnipeg was finally decided upon because it offered fish, game and building material as well as the lake for a highway.

The journey westward was started September 21, 1875, and was joined by most of the earlier settlers from Rosseau. A government loan defrayed the cost of travel and met the most pressing needs for existence on arrival. Indirect routing by rail took the travellers as far as Fishers Landing. Nine flat-boats and one York boat conveyed them from there down the Red River into Lake Winnipeg. The steamer *Colville* (the only one on the lake) towed the string of awkward craft along the west shore of the lake and abandoned them in a sheltered tarn on the south side of the Gimli harbour late on October 21, 1875. The journey up from Kinmount had taken exactly a month.

For three weeks the settlers laboured like madmen felling trees, shaping logs, erecting cabins, scraping away snow to get clay and moss to fill the cracks. The need for quick shelter made it impossible for family men to spread out over the district on properly located homesteads, and most of the tiny houses were huddled together in the clearing that is now the town of Gimli. The women and children walked ashore from the flat-boats, now frozen solidly in the ice, and took possession of their new homes.

The first permanent settlement of Icelandic people in Canada had been established. It was named "New Iceland" and the town, Gimli. It was destined to become the "Mother of Icelandic Settlements" which continued to grow and spread over the Canadian West, and even into the United States.

The establishment of this colony turned the tide of Icelandic immigration definitely to Canada. Before the turn of the century something like 14,000 Icelanders had left familiar haunts and had come venturing to the new world. They came looking for land and were prepared for hard work. Prairie and bushland were claimed from the wilderness and made to yield a living. The great inland fisheries on the lakes of Manitoba had their beginnings and expanded under Icelandic direction. Winnipeg eventually became the home of more Icelanders (between 4,000 and 5,000) than are congregated in any other city in the world except Reykjavik, the capital of Iceland.

The census returns of 1881 and 1891 omitted mention of any Icelanders in Canada; they were probably included in the column headed, "Other Nationalities". A rough estimate indicates that 10,000 were here by 1891.

The total in 1931 — the last census return available — was 19,382 in the whole of Canada. The Icelandic National League, in its publication, *The Timarit*, 1932 issue, disagrees with the official census takers and would place the total at 37,101 persons of Icelandic origin.

At least sixty-five per cent of the Icelandic population is on the land or

engaged in the primary industries, particularly in Manitoba and Saskatchewan. A few hundred live in Alberta and British Columbia, and a negligible number in Eastern Canada.

Spectacular improvement in conditions in Iceland had reduced immigration to this continent to a mere trickle long before the first Great War broke out.

Even the briefest survey of the history of the Icelandic citizens of Canada and their contribution to its national life must be prefaced with some reference to their origin and traditions.

The virgin island of Iceland, referred to in the annals of the Venerable Bede as the "Ultima Thule", was colonized from 874 to 930, A.D., chiefly by Norse chieftains and their retainers. They were members of the ruling class of Norway who took to the open seas and exile rather than submit to the over-lordship of Harald the Fairhaired.

The country was divided into four self-governing districts, with major issues referred to the *Althing*, annual gathering of representatives from all over the land, which was established in 930 and still functions. Laws, setting out the natural rights of free-born men, were codified. There was free speech and trial by jury. Lawyers quoted precedent and invoked ancient laws in their arguments before the tribunals.

The young men sailed abroad to raid and to trade — this was still the viking age. All this stirring of men's minds resulted in the production of a great wealth of literature before the end of the twelfth century in the form of Icelandic "Sagas".

Iceland in time was scourged by the various evils which marked Europe in the dark ages including strife, pestilence and famine. But freedom was enthroned in the sagas and refused to die. Tales of adventure and g'orious deeds were woven into the home life, even of the poorest. Readers and "sagamen" were appointed to entertain while the people worked through the long dark days of the Arctic winters.

At the time when thoughts of migrating to the New World began to spread in Iceland, the country was just emerging from a Danish trade monopoly, economically exhausted, with an empty treasury and not a single seaworthy keel to its name.

The "New Iceland" by Lake Winnipeg was a centuries-old dream come true on a far horizon.

The name "New Iceland" disappeared long ago and the whole district is referred to as Gimli. There was over-crowding and illness and lack of comforts in the embryo town that first winter, but people thought in hopeful terms of the future and did their best to create cheerfulness. Three issues of a handwritten newspaper were circulated; poems and comic skits burlesqued their plight; laymen conducted services; there was community singing, and by January, a provisional town council was functioning.

From three squaws, accidentally encountered on the harbour-front, who were successfully obtaining fish from two holes in the thick ice, the settlers learned the rudiments of ice-fishing. This knowledge made a valuable addition to the food supply. It also was the first step in the

Bottom right:—Icelandic children's choir, Winnipeg.

Bottom left:—A group of little dance maids in Icelandic costumes at Riverton, Manitoba.

Icelandic National Day celebration at Hnausa, Lake Winnipeg, August 2, 1938.

opening up of the inland fishing industry of Manitoba lakes, seventy-five per cent of which is carried out by Icelandic fishermen to this day.

The following summer, 1,200 immigrants, brought from Iceland by Sigtryggur Jonasson, homesteaded a thirty-mile strip north along the coast, including Big Island. Jonasson built where the town of Riverton now stands.

Disaster was in the offing. Smallpox hit the settlement that fall and raged through the early winter with a death toll of 102. The district was isolated in its misery behind an armed guard at the Manitoba boundary. Medical aid and some supplies were sent in by the province. Quarantine lasted until July, 1877, making all seeding impossible. Many families, discouraged and heart-sore, left for Winnipeg, and eventually settled in the States. Farms stood abandoned and only fifty families remained — mostly members of the original party.

Resolutely they set to work to repair the havoc; built new and better cabins over the ashes of the old, burned in the cleaning-up after the smallpox, and were comforted and encouraged by the visit of Lord Dufferin in the fall, an old friend who had visited Iceland and formed a good opinion of its people (*Letters of a High Latitude*).

The story of the pioneers of the Gimli district is one of toil and struggle, and prosperity was slow in coming. Departures were frequent in the search for greener fields and quicker returns, but the thinned ranks closed the gaps or filled them with fresh recruits without resources.

In 1879 there were 214 homes and a population of 1,020. The colonists had

38. The gathering is representative of the northern part of the district.

harvested a variety of crops including 13,168 bushels of potatoes; they owned 1,217 cattle, 129 boats, including a steamer, and a sawmill appeared in '81. The profits from the early fish catches, often large, were eaten up by the cost of haulage to the railhead at Selkirk.

In 1901, the northern district received an impetus from the settlement of two new areas, Ardal and Vidir, to the north and west, by more experienced Icelandic farmers from the Dakota colonies, many of them with substantial capital.

The railroad reached Gimli Town in 1905, Arborg, (town in Ardal) in 1910, and, finally, Riverton in 1914. Riverton is also the northern terminus of the Jefferson Highway.

There are flourishing creameries at Arborg and Riverton; drainage has made vast swamp and marshlands tillable, and, in 1939, the wheat fields of the northern Gimli district topped the province with a yield of thirty and forty bushels to the acre. Pulpwood, hay, lumber, grains, cattle, fish and dairy products are exported, and to-day, the district is rated as one of the most flourishing mixed farming areas in Manitoba.

From Gimli came the pioneers who opened up the Argyle region in western Manitoba in 1880. It grew rapidly to become in time one of the wealthiest wheat-growing centres of the West. Falling grain prices and depression years, however, have taken a heavy toll.

Churchbridge, Saskatchewan, was pioneered by Icelanders in 1885, and remains a substantial mixed farming district. The largest farm colony of Icelanders in Canada is located around Foam Lake, Quill Lake and Fishing Lake in central,

northern Saskatchewan, and was settled from 1891 to 1909. It grew excellent wheat for many years. Beautiful homes and modern farm machinery leave few reminders of pioneer struggling. A change to mixed farming is beginning to restore the losses suffered in the depression.

Another offshoot of the Gimli settlement is the large mixed farming and fishing colony begun in 1886 on the east shores of Lake Manitoba. It has spread around the lake, far into the north country and eastward to a depth of twenty miles. The depression was felt less in this area than among the wheat growers and city populations.

There are Icelandic settlements, small and large, on the prairies, at the coast, and even in the Peace River.

The first appearance of Icelanders in Winnipeg was in the fall of 1875 when single persons from the Gimli party remained behind in search of employment. The city was in its infancy, without a railroad, and almost on the edge of the western wilderness. The first homes were flat-roofed shanties, built on the Hudson Bay "flats", between the Red River and where now stands the C.P.R. station.

The only work open to the women was housework at from four to ten dollars a month — at least until they learned English. The men found work at railroad grading for fifteen cents an hour, dug ditches or cut wood for even less. Epithets of Irish road bosses lost both colour and vigour when it was discovered that the new hands tried just as hard when nobody was standing over them.

When the first families with children arrived the following year, these poorly paid young people supported a school for them. It was important to learn English and learn it correctly. They also contributed to the first of many efforts to provide hospitality and help for new arrivals and sent money to their families as well.

The Icelandic Association, formed in 1877, aimed: "To cherish the honour of our race", and to "Encourage the democratic, progressive spirit which has always been a characteristic of the Icelandic people".

The first Icelandic store was opened on Main Street in 1879 by Arni Frederickson, later the first of several aldermen to serve the city. As their numbers increased and the city grew, the Icelanders improved their position. Both men and women have worked on every rung of the ladder of progress, systematically from the bottom up. For a time the women stood out in the dressmaking field, the men became builders and workers in the building trades. They built thousands of Winnipeg homes to live in themselves and on contract for others. They erected more than 100 apartment blocks, ranging in cost from $20,000 to $250,000.

Thorsteinn Borgfjord, an immigrant boy of twelve in 1886, rose by the hard way of apprenticeship to be vice-president and superintendent of construction of the McDiarmid Construction Company, builders of importance from the Great Lakes to the Pacific Coast. One of his many trusty deeds was the completion of the Manitoba Legislative Buildings, a six-year contract. An Icelander in Vancouver manufactures interior finishings, and another in Winnipeg employs seventy people making an insulating product which he originated.

Both urban and rural Icelanders have long ago become inseparable from other residents in the interest they take in the various activities which make up the social structure. They do, however, carry on a great deal of organized work of interest to them alone as a distinct racial group. The celebration of the Icelandic national holiday, August 2, has been an annual feature in the life of Winnipeg Icelanders for half a century. Of late years they have joined with Gimli, with the setting amidst the evergreens of the town's lovely, natural park; Canada, Iceland and the pioneers are toasted in verse and prose. The older people listen to the speeches and recall old times, and the younger ones engage in various sports and dancing. Similar celebrations of the day are going on simultaneously at many points in Canada and the United

A typical well-groomed Icelandic farmstead near Wynyard, Saskatchewan.

The harbour at Gimli as it looks to-day, with its pier, lighthouse and breakwater.

States, whereever enough Icelanders are congregated.

There are two dominant church organizations with strongly entrenched synods, the Lutheran Synod, formally organized in 1884 and the Federated Church in 1901. Both have numerous congregations scattered among the Icelandic settlements in Western Canada and the United States.

A great quantity of literature in the Icelandic language has been turned out on this continent including some first-grade poetry, short stories, magazines, annuals and newspapers. Nine publications originated in the Gimli district, none of which have survived, and twenty-five others in Winnipeg. The most important among the latter, still circulating, are the two weeklies the *Heimskringla*, Conservative in politics, founded in 1886; and the *Logberg*, Liberal, in 1889. These two papers go far afield: on the home front, to sixty Manitoba points, thirty in Saskatchewan, fourteen in Alberta, twelve in British Columbia, nine in Ontario and one in Quebec; abroad, to many points in the United States and Iceland.

The organization which has the most general support of all parties among the Canadian Icelanders is their National League with its avowed, threefold aim: (a) To strive to the utmost to help Icelanders to become the finest possible citizens of Canada; (b) To promote and strengthen the knowledge of Icelandic language and literature on the American Continent; (c) To create goodwill and cooperation between Icelanders on both sides of the Atlantic and to bring to the attention of the people of this continent their finest attributes and characteristics.

Early Icelanders fell into two classes politically, Liberal and Conservative, getting their political views ready-made in the course of passage to Canada from the agents in charge who represented whichever party was in power in the Dominion House.

Politics, or "the affairs of the country" as the Icelanders prefer to term it, have always interested them profoundly, not as a game of wits, but as something vital to freedom and the democratic way of living.

The outstanding musical organization is the Icelandic Male Voice Choir, Winnipeg, under Ragnar H. Ragnar. It is frequently on the air and specializes in songs in the Icelandic tongue and the works of Scandinavian composers.

The taking of "seisin" in the Icelandic tradition was never completed until blood had been shed for the new land. In the Great War, 1914-1918, 128 Icelanders with the Canadian forces were killed in action, 207 were wounded, and 27 were decorated for valour including one nursing sister.

Many persons of Icelandic blood have made their contribution to professional and public life, and many have made enviable records in a variety of fields of activity.

Icelandic teachers by the hundreds have gone through the normal schools of Manitoba and Saskatchewan, and are leaving their mark on school populations in secondary and public schools, both urban and rural.

Icelandic names in the lists of winners of medals and scholarships in university and high-school examinations on the prairies have been a conspicuous feature for nearly forty years. Apparently this is not achieved by the sacrifice of other interests for notable records have also been scored in both music and sports.

Icelanders have proved adaptable and quick to adjust themselves to the country's ways. They have set other racial groups in Canada a high standard in honesty and general regard for the law. They were the first to prove that under the garb of the "New Canadian" there may be much that is worth-while for the future.

The pioneers proved their endurance, industry and resourcefulness. The war tested loyalty and courage. It is inevitable that, with no new infusion of Icelandic blood, this racial group will become an inseparable part of future Canadians. Icelanders themselves like to think that the strand which is of their weaving will be found a durable and trusty one.

The 1940 delegates to the twenty-first annual meeting of the Icelandic National League in Winnipeg. Members from 51 Canadian and 33 United States centres, as well as a few members from Iceland, are represented.

A Governor General o Canada visits Gimli fo the second time. The lat Lord Tweedsmuir pho tographed with Cana dians of Icelandic origi when at Gimli in 1936

Icelandic Male Voice Choir, Winnipeg, whose annual concert is an event in musical circles. Conductor-Accompanist, Ragnar H. Ragnar, bottom row, centre.

The brink of Webster's Falls above Dundas, Ontario.

LESSER FALLS OF THE NIAGARA ESCARPMENT

by JOHN E. MASON

ALL along the Niagara escarpment from Queenston to Ancaster and across the Dundas Valley which breaks the escarpment's continuity through the depredations of a mighty prehistoric river that flowed oceanwards in past ages, there are many lesser cataracts whose waters plunge over its rocky summit to eventually find a rendezvous in Lake Ontario. Set in the beautiful environs of Nature, these waterfalls were not always admired solely for their natural beauty but were regarded by early settlers as a heaven-sent means for generating power necessary to mill the grain that was their main sustenance.

A few miles from Thorold and close to the scene of Laura Secord's historic exploit during the troublesome period of 1812-14,

Top left:—The Washboard Falls in Bulmer's Ravine, near Ancaster, Ontario.
Bottom left:—Waterdown's picturesque cataract.

the Beaver Dam Creek plunges over the escarpment's edge close by the old DeCue homestead, while to the westward on the Twenty-Mile Creek, a short distance south of Jordan Village, Ball's Falls, in season, is one of the escarpment's finest waterfalls, having a sheer plunge of almost a hundred feet with a roar resembling the mighty Niagara.

At various localities the escarpment is marked with deep indentations as if, at some remote period, a river or stream of major proportions plunged over its side. Fifty-five years ago, the late Colonel P. S. VanWagner, a pioneer settler at the head of Lake Ontario, contributed an informative paper to the proceedings of the Hamilton Scientific Association dealing with the ancient Grand River, which, he claimed, until some upheaval of Nature changed its course toward Lake Erie, plunged over the escarpment at Albion, five miles east of Hamilton, then continued its course to Lake Ontario and Hamilton Bay. There is still a waterfall at Albion fed by a stream that drains the land north of the present Grand River, and it is one of the beauty spots among the lesser cataracts with its waters flowing through a deep rock-strewn ravine that could only have been formed by a much larger stream in past ages.

When the Indian reigned supreme on this continent, seven giant oak trees grew by the banks of a stream where it plunges over the escarpment overlooking what now is the western part of Hamilton. A tribe of Six Nations Indians named the spot "Chedoke" making use of the site as a burial-ground for tribe members who had entered the happy hunting-ground. There is a legend that when Chedoke passed into the possession of the white man who built the first home on the property, the Indians placed a "curse" on the house and all who would live in it. Strange as it may seem, the eldest sons of two families who occupied the dwelling at different times met violent deaths.

Close to the environs of Ancaster and in the village itself, three waterfalls add beauty to cool, deep, flower and pine-scented ravines. They are the Washboard and Lower Falls in Bulmer's Ravine, accessible half-way up the Ancaster mountain road on No. 2 Highway. The stream that falls over the escarpment at Ancaster was one of the first to be harnessed for power by early settlers, some of whom walked, rode, or drove oxen fifty and sixty miles to have grain milled into flour at this early settlement.

Across the Dundas Valley, through the ancient and modern Town of Dundas, named after Henry Dundas (Viscount Melville)—Secretary for War in the Duke of Portland's cabinet—up the northern continuation of the escarpment, via No. 8 Highway, one comes to a little refreshment stand bearing the name "Webster's Falls" which marks the site of a picturesque cataract where the stream plunges seventy-five feet to the rocks below.

At Waterdown, on Dundas Highway No. 5, in the grounds of Mr. Wm. R. Barnes at the Waterdown end of the Aldershot Road, the creek bearing the name of the village plunges over a shelf of rock for some twenty-five or thirty feet. It was in this vicinity the late Ralph Connor, famous Canadian author, was wont to retreat when seeking seclusion for writing some of his popular fiction.

All these picturesque places with their accompanying tumbling waters are accessible to motorists during a day's drive on any spring or summer day.

The falls at DeCue on the escarpment near Thorold, Ontario.

Above:—The Lower Falls in Bulmer's Ravine, near Ancaster, Ontario.

Top left:—In winter garb. Chedoke Falls on the escarpment west of Hamilton, Ontario.

Above:—Ball's Falls near Jordan, Ontario, on a freezing day in early winter.

Right:—Albion Falls on the escarpment near Hamilton, Ontario.

Some National Historic Sites in Western Canada

by **F. W. HOWAY**

FORT ROUGE

Fort Rouge, Winnipeg, Manitoba, — an old French fort. The junction of the Red River and the Assiniboine River — the site of the City of Winnipeg, was probably first seen, according to Dr. C. N. Bell, in 1731 by one of the sons of La Vérendrye or by his nephew, La Jemmeraye. Its strategic importance, especially for the interception of trade bound for Hudson Bay, was so plain that it appears that the construction of a fort there was at once contemplated. However, it was not until 1738 that Fort Rouge occupied the spot. That fort was not actually built by La Vérendrye, but with his approval, by Le Marque, the representative of his financial supporters. It was abandoned some time prior to 1749 as appears by a memorandum of that date regarding La Vérendrye's discoveries.

FORT GIBRALTAR

Fort Gibraltar, Winnipeg, Manitoba,— trading post of the North West Company. This fort was built by John McDonald of Garth, one of the partners of the North West Company. The date of its construction is uncertain; some writers favouring 1814, some 1806, some 1807 and some 1803. It was quite an imposing affair, a palisaded enclosure containing eight buildings. After the arrival of the Selkirk colonists it became the centre of opposition to that colony. To it the Nor'westers removed the field pieces and other property which they had taken from the settlers. In October, 1815, it was captured by Colin Robertson under Governor Semple's direction; but it was later restored. When it became apparent that it was a rendezvous for Bois Brûlés, bent on the extermination of the settlement, Robertson, in March 1816, under Semple's orders, recaptured it. Governor Semple destroyed it in May 1816, and utilized some of its materials in the strengthening of his own post, Fort Douglas. When Gibraltar again reared its head it bore the name of Fort Garry.

FORT GARRY

Fort Garry, also called Upper Fort Garry, Winnipeg, Manitoba,—a Hudson's Bay Company's trading post.

After the union of the North West Company and the Hudson's Bay Company in 1821, Fort Gibraltar, which had been destroyed in 1816 during the bitter struggle that centred around the Selkirk colony, was rebuilt under orders of Governor George Simpson. The reconstructed post, however, obtained a new name, Fort Garry, after Nicholas Garry, the Deputy-Governor of the Hudson's Bay Company, 1822-35. It soon became the headquarters of the company in America. As early as 1830 its dilapidated state, its liability to flooding during the spring freshets, and its inconvenient situation owing to the St. Andrew's Rapids induced the company to decide upon the building of a new or Lower Fort Garry. Nevertheless the old Fort Garry remained; Winnipeg began to grow up around it, and in 1835, instead of being abandoned, it was rebuilt in stone and on a more elevated site than it had originally occupied. At Upper Fort Garry the affairs of the colony of Assiniboine were chiefly transacted; and there was the seat of the Governor of that colony. This old fort was the scene of stirring events in the Riel Rebellion, 1870. Now nothing remains upon its ancient site to tell its story but the old stone gateway.

LOWER FORT GARRY

Lower Fort Garry —"The Stone Fort", near Winnipeg, Manitoba. On the western bank of the Red River, about twenty miles north of the City of Winnipeg stands Lower Fort Garry. It was begun in 1831

by the Hudson's Bay Company and was named, as was the Upper fort, after Nicholas Garry, Deputy-Governor of the company, 1822-35. The buildings, which were of stone quarried in the vicinity, were first completed. Governor Simpson and his family resided in them in the winter of 1833-34. The walls were constructed in 1839. They are seven and a half feet high, and three feet thick and enclose a little more than four and a half acres.

In the days of Governor Simpson the annual council of the company frequently met in the Council House in this fort. Here came in 1846 Colonel Crofton in command of a body of Artillery and Royal Engineers sent out in view of possible difficulties over the Oregon question. Colonel Wolseley and his men were stationed in the fort at the close of the Riel Rebellion, 1870. And at this fort was signed, in 1871, the first of that series of treaties, between the Canadian Government and the Indians of the West whereby their claims to the lands comprised in the three Prairie Provinces were extinguished. To those treaties Canada owes much of the peace that has prevailed in the Canadian West.

On the recommendation of the Historic Sites and Monuments Board of Canada, a tablet has been affixed to the gateway of "Old" Fort Garry, near Main Street, Winnipeg, to mark the four forts which stood nearby. This tablet bears the following inscription:

> Near this site stood four historic forts.
> Fort Rouge, at the "forks" of the river, was established by La Vérendrye in 1738.
> Fort Gibraltar, at the north-west junction of the rivers, was built by the North West Company in 1804.
> Near the same site was located "Old" Fort Garry, the headquarters of the Hudson's Bay Company after the coalition with the North West Company in 1821.
> The "New" Fort Garry, built of stone in 1836-39, was the seat of government until the transfer to Canada in 1870.

FORT DOUGLAS
WINNIPEG, MANITOBA

Thomas Douglas, Earl of Selkirk, obtained, in 1811, from the Hudson's Bay Company a grant of an immense area of land surrounding the junction of the Red River and the Assiniboine River. In 1812 he began the establishment of the first British settlement west of the Great Lakes. The location chosen was at a sharp bend of the Red River some two miles below its confluence with the Assiniboine —the spot later known as Point Douglas. There in the autumn of 1812 the first wheat in the West was sown. At that point, for the protection of the infant colony, Fort Douglas was built. After its destruction by the Nor'westers in 1815 it was rebuilt in the same year. From the outset the presence of the colony was regarded by the North West Company as hostile to its interests, and its people made every effort to induce the settlers to abandon the scheme. With reinforcements in 1813 and 1814, the little settlement held on despite the opposition. In 1814 the hostility of the Nor'westers became more active and soon a series of mutual aggressions commenced which culminated in June 1816 in the skirmish at Seven Oaks (now within the City of Winnipeg) in which fell Robert Semple, the Governor of the colony, . and twenty of his men. This bloodshed was a strong influence towards the union of the two fur companies after nearly forty years of rivalry.

On the recommendation of the Historic Sites and Monuments Board of Canada, a cairn, with a tablet bearing the following inscription, has been placed in Sir William Whyte Park to mark the former site of this fort:

> Near this site at the bend of the Red River stood Fort Douglas, headquarters of the first British settlement west of the great lakes.
> The Red River Settlement, founded by Lord Selkirk, was established under Captain Miles Macdonnell, in 1812.
> Fort Douglas though destroyed by the North West Company, in 1815, was rebuilt in the same year and remained the headquarters of the settlement until the Hudson's Bay Company became the owners, in 1834.
> On Point Douglas, in the autumn of 1812, the first wheat in the West was sown.

FORT LIVINGSTONE
SASKATCHEWAN

Fort Livingstone was the first headquarters of the North West Mounted

Police and first seat of government of the North West Territories. On October 7, 1876, the North West Territories Act was proclaimed, bringing those territories into being. The Honourable David Laird was appointed Lieutenant-Governor, and with a Council of four, was authorized to legislate within certain defined limits. The Lieutenant-Governor and the members of his Council were sworn into office on November 27, 1876, at Livingstone, Swan River. The North West Mounted Police headquarters had already been established there, and there, too, the seat of government was temporarily placed, awaiting the completion of the necessary public buildings at Battleford. The Territorial Council held its first session at Livingstone on March 8, 1877. The legislation dealt with the administration of justice, registration of deeds, protection of the buffalo, prevention of prairie and forest fires, establishment of ferries, and prevention of infectious diseases. On August 1, 1877, the seat of government in the North West Territories was removed from Fort Livingstone to Battleford.

On the recommendation of the Historic Sites and Monuments Board of Canada, a cairn, with a tablet bearing the following inscription, has been erected three miles north-west of Pelly:

> Fort Livingstone, first capital of the North-West Territories, 1876-1877. Here Lieutenant-Governor Laird and his Council were sworn into office on 27th November, 1876, and here, on 8th March, 1877, was held the first session of the North-West Council.

FORT WALSH
SASKATCHEWAN

A fort of the North West Mounted Police, in the Cypress Hills, a short distance east of the Alberta boundary and near the international line.

The Cypress Hills, because of the buffalo, were the great hunting grounds, and hence, almost of necessity, the great warring grounds of Cree and Saulteaux and Sioux. As soon as the North West Mounted Police had established themselves at Fort Macleod (1874) the troubles amongst the Indians and between them and the whiskey traders in the Cypress Hills called for attention.

In the spring of 1875 Inspector Walsh with "B" Division, fifty men, built Fort Walsh. It was just in time; for in the following year Sitting Bull and his Sioux, after annihilating the Seventh Cavalry, under Major-General Custer, in the valley of the Big Horn River, retreated into Canada and reached the Cypress Hills and safety. Three months later came Medicine Bear and with him 900 lodges of the Yankton Sioux. The presence of these Indians was a matter of much concern to the Mounted Police, and, doubtless, they breathed more freely when, in 1881, Sitting Bull and his band were induced to return to the United States.

From the very day that it was built the influence of Fort Walsh for law and order in the land was felt by white man and red man alike. With a stern hand, the whiskey traders were put down, the intertribal disputes adjusted, and peace and safety maintained.

The number of men at Fort Walsh varied from time to time. For about three years, 1878-1881, while these American Indians were in the vicinity, Fort Walsh was the headquarters of the Mounted Police. With the building of the Canadian Pacific Railway the centre of gravity changed to the northward, the post lost its importance, and about 1883, it was abandoned. It had done its work well!

On the recommendation of the Historic Sites and Monuments Board of Canada, a cairn, with a bronze tablet bearing the following inscription, has been placed half a mile north-east of Coulée to mark the site of this fort:

> FORT WALSH
>
> A post of the North West Mounted Police, built by Inspector J. M. Walsh in 1875.
>
> In the Cypress Hills where hunting bands of the Blackfeet, Crees, Assiniboines, Saulteaux and Sioux met and fought, 102 officers and men, in 1876, imposed Queen's Law on "a fretful realm".
>
> Headquarters of Commissioner A. G. Irvine until December, 1882.
>
> The post was removed to Maple Creek in 1883. The buildings stood about 200 yards west of this spot.

FORT CALGARY
CALGARY, ALBERTA

In 1874 the North West Mounted Police established their first post in Alberta, Fort Macleod. They were soon determined to build another about two hundred miles north from that fort, and another two hundred miles east therefrom. The first became Calgary, the second Fort Walsh. On August 18, 1875, "F" Troop of fifty men of the Mounted Police under Inspector E. A. Brisebois, set out for the northward for this purpose. Five days later they arrived on the banks of the Bow River. Thence they continued towards the Red Deer River and later returned to the junction of the Bow and Elbow Rivers, which was selected as the site of the post. At once the work of clearing the spot and erecting the fort was commenced, and before Christmas, the buildings were ready for occupation. Inspector Brisebois wished to name the establishment after himself, but Colonel Macleod, then Assistant-Commissioner of the force, decreed that it be called Calgary, the name of an estate in the Isle of Mull belonging to the Macleod family, and meaning in the Gaelic: "clear, running water". Close by the fort soon appeared the stores of the Hudson's Bay Company and I. G. Baker & Company and a billard room. These with two dwelling houses were the nucleus of the City of Calgary.

On the recommendation of the Historic Sites and Monuments Board of Canada, a cairn, with a tablet bearing the following inscription, has been erected in Central Park, Calgary, to commemorate this event:

> FORT CALGARY
>
> To commemorate the arrival, in August, 1875, of Troop "F" of the North West Mounted Police, under Inspector E. A. Brisebois, and the establishment of their post, Fort Calgary, on the west bank of the Elbow River at its junction with the Bow River, within the limits of the City of Calgary.

DAVID THOMPSON

This celebrated man, whom Mr. J. B. Tyrrell acclaims as "Canada's greatest geographer", spent twenty-seven years in trade and exploration in the West. From 1785 to 1797 he was in the service of the Hudson's Bay Company, principally in the vicinity of Hudson Bay; but in 1797 he joined the more energetic North West Company, became a partner therein, and remained with them until 1812. During those fifteen years he did his great work of exploration on the prairies and west of the Rocky Mountains, and prepared his great map — the first accurate and scientific representation of Canada's geography.

In 1807 Thompson, venturing forth from Rocky Mountain House on the North Saskatchewan, discovered the headwaters of the Columbia River, and during the next three years built trading posts for the North West Company in southern British Columbia, Idaho, and Washington. His advent brought arms and ammunition to the western tribes, who, thus equipped, no longer feared their hereditary enemies, the Piegans. That tribe, in consequence, resolved that no further supplies should be taken over the mountains. In the late fall of 1810, when Thompson attempted to return to the Columbia River by his usual route up the North Saskatchewan, the Piegans intercepted him. This route barred, though it was the middle of September, he resolved to cross the mountains with his trading goods by a more northerly pass.

He journeyed with horses from the Saskatchewan to the Athabaska and as far as the spot now known as Jasper House. There he substituted dogs for horses and set out for the Columbia. It was a terrible undertaking to make such a journey for the first time over unknown country on snowshoes and in sub-zero temperature for much of the time. But his determination carried him through; he overcame climatic and natural obstacles and the craven spirit of his men; he found and made his way through the Athabaska Pass, and transported his goods across from the Athabaska to the Big Bend of the Columbia. Four of his disheartened and almost mutinous men deserted. The story of the great achievement Thompson tells plainly and simply in his *Narrative*, published by the Champlain Society in 1916. On one occasion after the day's march he left the camp to examine the surrounding country and ascertain the probable route for the

next day. On his return he found the men striving to find the depth of the snow with a twenty-foot pole. He tried to cheer them by reminding them that, having snowshoes, they should not care whether the snow was ten or a hundred feet deep. Then, true scientist, he peered into the hole and was surprised to notice the varying shades, depending upon the depth.

In three weeks (December 29, 1810—January 18, 1811) Thompson and his dispirited party had accomplished the pioneer crossing by white men from Jasper House to the Columbia. When he reached that river he attempted to ascend it, but his men were so few and in such a humour that he thought it best to retrace his steps to the junction of Canoe River and the Columbia—the well-known Boat Encampment. There he remained until April 17, 1811, when he left for Kootenay House, which he had built in 1807, near Lake Windermere. Thus was the Athabaska Pass discovered and the new trade route established across the Rocky Mountains.

On the recommendation of the Historic Sites and Monuments Board of Canada, a cairn, with a tablet bearing the following inscription, has been erected in Jasper National Park, Alberta:

THE DISCOVERER OF
ATHABASKA PASS

In midwinter, 1810-11, David Thompson, of the North West Company, with ten companions discovered and travelled through this pass to the Columbia River. It immediately became the regular route across the mountains and so continued until the advent of railway communication.

To David Thompson, Canada owes the first accurately prepared map of the Great West, embodying the results of his surveys and explorations from 1789 to 1812.

THE CARIBOO GOLD FIELDS BARKERVILLE, BRITISH COLUMBIA

Before 1858 the mainland of British Columbia was merely a fur preserve. In that year a great change occurred: the discovery of gold in the bars of Fraser River caused a sudden influx of miners. The Fraser River mines were disappointing — not that they failed to produce gold, but that the amount did not equal the high expectations of the adventurers. The disheartened returned to California; the determined persisted. Through 1858 and 1859 they pressed steadily up the Fraser and its tributary, the Quesnel, mining as they went. By 1859 they had arrived at Quesnel Lake and had found gold on all its creeks. Still they kept on. The next year they reached Cariboo Lake. Its Keighley Creek, the first of the Cariboo creeks, proved not only rich but also stimulating and encouraging. It flowed from Agnes, commonly called the Bald, Mountain — the source of all the rich Cariboo creeks.

Late in 1860, obeying the ever present urge of

"Something hidden. Go and find it. Go and look behind the Ranges . . .
Something lost behind the Ranges. Lost and waiting for you. Go!"

they ventured to ascend the forbidding mountain. From its height they looked upon Cariboo — the Golden Land of Promise—and over it all the veil of solitude and silence. Proceeding northerly they came down upon Antler Creek and saw quantities of its gold lying exposed on the bare bed-rock. But Antler was only the portal of Cariboo. In the early spring of 1861, William Dietz and his partners, spurred on into the unknown by the lure of the gold, crossed another part of Bald Mountain and found the famous creek of Cariboo — Williams.

At first Williams Creek gave no hint of its hidden riches, but when the true bed-rock was reached, it yielded enormously — in 1861, nearly $3,000,000. In 1862 the deep diggings in the lower portion of Williams Creek were found and another $3,000,000 came from the depths of the earth. In 1863 Lord Milton and Dr. Cheadle saw a wash-up on the Raby claim which, as the result of fifteen hours of work, amounted to about a quart of gold worth £1000; the Cunningham claim produced an average of $2000 a day during the season; and the Diller claim capped them all by yielding 102 POUNDS Troy of gold in one day. And so from year to year, Cariboo added to the wealth of the world.

It is estimated that the two and a half miles of Williams Creek that were mined,

produced in twelve years about $20,000,000. Lightning, Lowhee, Mosquito, Jack of Clubs, and a hundred other creeks and gulches contributed their quota, and carried the total gold output of Cariboo in that time to possibly $40,000,000 or $50,000,000. And the end is not yet; though placer mining is practically ended, Cariboo is becoming known for its ledge mining.

Such an outpouring of wealth brought many adventurers and called for better means of transportation. The Cariboo Wagon Road from Yale to Williams Creek, a distance of about 400 miles, was built in 1862-65. This gave easier access and insured a constant supply of necessaries at comparatively reasonable figures. It served also to assist the general development and thus became an important factor in the economic upbuilding of British Columbia.

On the recommendation of the Historic Sites and Monuments Board of Canada, a cairn, with a commemorative tablet bearing the following inscription, has been erected on the side of the road, about 100 yards from the Anglican Church, Barkerville, B.C.:

CARIBOO GOLD FIELDS
BARKERVILLE

The centre of old Cariboo, whose gold fields, discovered in 1861, have added over forty millions to the wealth of the world.

Here was the terminus of the Great Wagon Road from Yale, completed in 1865.

The story of the Cariboo Gold Mines and the Cariboo Road is the epic of British Columbia.

THE LAST SPANISH EXPLORATION POINT GREY, B.C.

In the eighteenth century Spain claimed the sovereignty of all the western coast of America. The activities of the Russians in Alaska and of the British traders farther south aroused her to action. In support of her claim Spain established in 1789 a settlement at Nootka Sound. From that centre she despatched numerous exploring expeditions northward and southward. The Strait of Juan de Fuca, which, it was thought, might lead to a passage to the Atlantic, attracted much of her attention. After unsuccessful efforts in 1790 and 1791, she sent out from Nootka in June, 1792, the schooners *Sutil* and *Mexicana*, to complete the examination of that mysterious waterway. Captain George Vancouver was, at the same time, engaged in a similar undertaking for Great Britain.

The Spanish vessels, after examining the islands on the westerly side of the Strait of Georgia, anchored on June 21, 1792, near Point Grey. There Captain Vancouver found them. The two expeditions, after discussing the problem very freely and amicably, resolved to carry on the work together. Accordingly, the Spanish schooners left Point Grey, and, in company with the British ships, proceeded up the strait. Together they examined the mainland side as far as Bute Inlet, comparing their observations and exchanging information. But the Spanish craft were very slow sailers, and after Vancouver's officers had found an exit to the ocean by way of Seymour Narrows the ships separated: Vancouver passing out to Queen Charlotte Sound by the route his men had discovered; the Spaniards pursuing their course to that sound by the more easterly channels.

The meeting of the English and Spanish officers near Point Grey was an unique event in the story of the coast. Spain was then on the verge of abandoning the last shadow of her claims; while Britain was strengthening hers by Vancouver's great work.

On the recommendation of the Historic Sites and Monuments Board of Canada, a cut-stone monument, to which has been affixed a commemorative tablet bearing the following inscription, has been erected at Point Grey, one mile west of Vancouver, on Marine Drive, near the University of British Columbia:

THE LAST SPANISH EXPLORATION

In commemoration of the first friendly meeting of the British and the Spaniards in these waters. Near this place Captain George Vancouver, on 22nd June, 1792, met the Sutil and Mexicana under captains Galiano and Valdés — the last Spanish exploring expedition on what is now the British Columbian coast. The commanders exchanged information, established mutual confidence, and continued the exploration together.

It was dawn for Britain but twilight for Spain.

EDITOR'S NOTE-BOOK

E. S. Archibald, B.A., B.S.A., D.Sc., LL.D., provides in his article "Prairie Farm Rehabilitation" an illuminating analysis of agricultural problems of the Dry Belt, the work of applied science in solving these problems, and some practical results in reclaiming dry-belt areas to assured usefulness. A graduate of Acadia University in the province of his birth, Dr. Archibald graduated as a bachelor of the science of agriculture from the University of Toronto in 1908. Since graduation, his contributions to this science have been recognized by honorary degrees conferred on him by Manitoba University and Acadia University. The writer has occupied successively important posts in the field about which he writes: Professor of Agriculture, Nova Scotia Agricultural College; Dominion Animal Husbandman, Central Experimental Farm, and since 1919, Director of Experimental Farms.

It was felt that Canadians in general would welcome information regarding their compatriots of Icelandic origin. Mrs. S. J. Sommerville, whose parents were among the first Icelandic pioneer families to come to Canada, supplies this need admirably. Born in Gimli, Manitoba, the most important Icelandic group centre, the writer taught school for several years while advancing her scholastic education. Later she joined the editorial staff of the Winnipeg Free Press which she served for ten years as reporter and feature writer. Mrs. Sommerville, whose husband is a physician now with the Canadian forces overseas, resides in Winnipeg.

Judge F. W. Howay, LL.B., LL.D., well-known historian, who contributes in this issue "Some National Historic Sites in Western Canada", needs little introduction to Canadians. Born in London, Ontario, he received his early education in British Columbia where, as Judge of the County Court of New Westminster, he now resides. He has been a member of the senate, University of British Columbia, since its establishment, 1915. A contributor to many historical journals, he has had many important historical works published.

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AMONGST THE NEW BOOKS

Romanian Furrow, by D. J. HALL (London: George Harrap, 1939, $1.75). Reading this enchanting book in the light of the present struggle fills one with a burning sympathy for a gallant people who in the years since the great war have made astonishing progress. United at last, with the land given to the peasants, they asked only to live at peace with all the world. Mr. Hall says: "The peasants *are* Romania. They are the most intelligent peasants I have ever known. That is why the country is content". And he found in the language convincing evidence of the unity of the people under whatever rule or influence they had lived. "For wherever I went I found no variation in the language, though in some places there were more Slav words than in others, there were no real dialects, whether in the Old Kingdom, Transylvania, the Bucovina or Bessarabia, and no appreciable accent to distinguish the upper and lower classes."

The book was first published in 1933 but has been unobtainable for some years until it was reissued in January 1939, with a foreword by Bruce Lockhart. Mr. Hall's warm sympathy with people who live on and by the soil proved an open sesame to the hearts and homes of the Romanian peasants. They welcomed him with charming and dignified hospitality, making him a member of the household. He learned their language, ate their food, wore their costumes and entered into all the work and fun, joys and sorrows of each village where he sojourned. He had long conversations with young and old, priests, doctors, "boyars" and peasants, danced and sang with the villagers at their festivals and marriage feasts, was taken by his friends, Costica, Nicu and others on visits to shrines and monasteries, ancient cities like Sibiiu, fathomless salt mines and little remote villages. Everywhere he records his experiences and impressions with great charm and unaffected simplicity. As he travelled in the Old Kingdom, in Transylvania, Moldavia and Bessarabia he reveals to us the various types of Romanian peasantry, richly different in their national costumes, yet alike in their sturdiness, their love of music, their respect for marriage and family life and their enduring capacity for hard work.

The quaint philosophy and earth lore of even the simplest peasants, their strong sense of fun, mingled with an underlying sadness for the past griefs of their country, all find expression in the songs of the people. Work and play, feasting or mourning, the coming of the seasons, each has its appropriate songs, and very beautiful and haunting we feel them to be in Mr. Hall's poetic translations. It wrings one's heart to think how much reason they now have to sing:

> "Oh poor strange land
> How long have I kept watch with you
> I have had too much of strangers."

As Bruce Lockhart says: "He shows us a people, who will never *willingly* submit to the embraces of Communism or Nazi-ism and who, like the peasants of all countries, have no desire for any other conquest than that of the earth which yields to them their daily bread."

FLORENCE E. FORSEY